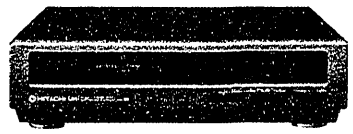
HITACHI

SERVICE MANUAL

TK | No. 3263E

VT-M140A/M141A
VT-M140AW
VT-M131A



Technical Data

SPECIFICATIONS

Recording:	Rotary two head Helical Scan Azimuth Recording
Video:	NTSC Color EIA Standard
Cassette:	VHS Type
Heads:	2 video heads 1 Full track audio/video erase head 1 Combination head for control track, audio erase and audio record/play (3 heads/single housing)
Tape Speed:	33.35 mm/sec (SP), 16.67 mm/sec (LP), 11.12 mm/sec (EP)
Tape Width:	12.7 mm
RF Output:	Channel 3 or Channel 4
RF Input:	UHF/VHF 75 ohm
Tuning Range:	VHF LOW CH, 2 ~ 6 (54 MHz – 88 MHz) VHF MID CH, A-5 ~ A-1 and A ~ I (90 MHz – 174 MHz) CATV VHF HIGH CH, 7 ~ 13 (174 MHz – 216 MHz) VHF SUPER CH, J ~ W (216 MHz – 300 MHz) CATV VHF HYPER CH, W+1 ~ W+28 (300 MHz – 468 MHz) CATV UHF CH, 14 ~ 69, W+29 ~ W+84 (470 MHz – 806 MHz)
Video Input:	1 – 2 Vp-p 75 ohm Unbalanced
Video Output:	1 Vp-p 75 ohm Unbalanced
Audio Input:	316 mV rms (–7.8 dB) 100 kohm
Audio Output:	316 mV rms (–7.8 dB) 600 ohm
Video Recording S/N:	Better than 46 dB (SP), Better than 43 dB (LP), Better than 40 dB (EP)
Horizontal Resolution:	240 lines (SP), 230 lines (LP), 230 lines (EP)
Audio Response:	50 Hz – 10 kHz (SP), 50 Hz – 7 kHz (LP), 100 Hz – 6 kHz (EP)
Audio S/N:	Better than 43 dB (SP), Better than 40 dB (LP), Better than 40 dB (EP)
Power Input:	AC 120V 60 Hz
Power Consumption:	23W Nominal
Cabinet Size:	14-9/16"(W) x 3-1/2"(H) x 12-5/8"(D) 37.0(W) x 8.9(H) x 32.0(D) cm
Weight:	11.7 lbs (5.3 kg)
Accessories:	1 – Coaxial cable 1 – Remote control unit 2 – Batteries

Design and Specifications subject to change without notice.

VHS

This video deck is a VHS type video recorder. For proper operation, only the VHS type cassette must be used.

Manuals related to the VT-M140A/M141A/M140AW/M131A

Name of Manual	Language	Manual No.	Chapters included
Technical Data	English	3263E	CHAPTER 1.2.3.5.6
	French	3269F	CHAPTER 3
	English	3265E	CHAPTER 2 (MACHA DIS).4
	French	3270F	CHAPTER 4
Technical Information	English	3264E	----

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

May 1990 TOKAI WORKS

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U-V TUNER	5-6 /	–
IF	5-8 /	–
RF CONVERTER	5-9 /	–
SENSOR	5-9 /	5-10
FRONT SWITCH	5-10 /	5-10
PRE/REC AMP	5-11 /	–
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SAFETY PRECAUTIONS

NOTICE: Comply with all cautions and safety related notes located on or inside the cabinet and on the chassis.

1. When replacing a chassis in the instrument, all the protective devices must be put back in place, such as barriers, non-metallic knobs, adjustment and compartment covers/shields, isolation resistors/capacitors, etc.
2. When service is required, observe the original lead-dress. Extra precautions should be taken to assure correct lead dress in the high voltage circuit.
3. Always use the manufacturer's replacement components. Especially critical components as indicated on the circuit diagram should not be replaced by other manufacturer's. Furthermore, where a short-circuit has occurred, replace those components that indicate evidence of overheating.
4. Before returning an instrument to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the instrument by the manufacturer has become defective or inadvertently defeated during servicing.

Therefore, the following checks should be performed for the continued protection of the customer and service technician.

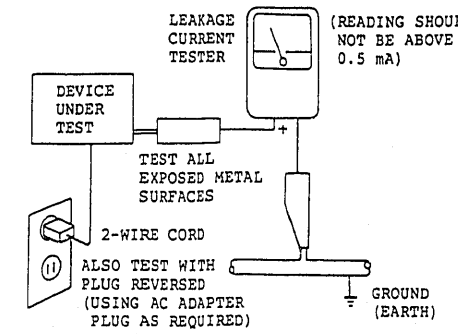
Leakage Current Cold Check

With the AC plug removed from the AC120V, 60Hz source, place a jumper across the two plug prongs. Turns the AC power switch on. Using an insulation tester (DC500V), connect one lead to the jumpered AC plug and touch the other lead to exposed metal parts (antennas, screwheads, metal overlays, control shafts, etc.), particularly any exposed metal part having a return path to the chassis. Exposed metal parts having a return path to the chassis should have a minimum resistor reading of 0.3 Mohm and a maximum resistor reading of 5 Mohm. Any resistor value below or above this range indicates an abnormality which requires corrective action. Exposed metal parts not having a return path to the chassis will indicate an open circuit.

Leakage Current Hot Check

Plug the AC line cord directly into a AC120V, 60 Hz outlet (do not use an isolation transformer for this check).

Turn the AC power switch on. Using a "Leakage Current Tester", measure for current from all exposed metal parts of the cabinet (antennas, screwheads, metal overlays, control shaft, etc.), particularly an exposed metal part having a return path to the chassis, to a known ground (earth) (water pipe, conduit, etc.). Any current measured must not exceed 0.5 mA.


LEAKAGE CURRENT TESTER
(READING SHOULD NOT BE ABOVE 0.5 mA)
DEVICE UNDER TEST
TEST ALL EXPOSED METAL SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUG AS REQUIRED)
GROUND (EARTH)

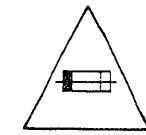
AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE UNIT TO THE CUSTOMER.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.
Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.
Product safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies of, HITACHI Service Manual may be obtained at a nominal charge from HITACHI SALES CORPORATION.

CAUTION AGAINST FUSE REPLACEMENT



CAUTION : FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AMPERE, VOLT FUSE.
ATTENTION : AFIN D'ASSURER UNE PROTECTION PERMANENTE CONTRE LES RISQUES D'INCENDIE, REMPLACER UNIQUEMENT PAR UN FUSIBLE DE MEME TYPE ET DE AMPERES VOLTS.

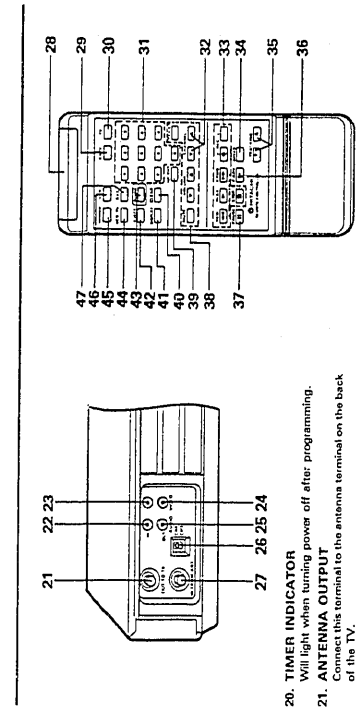
This symbol indicates Fast Operating Type Fuse.

COMPARISON WITH PREVIOUS MODEL

	ITEM		VT-M12XA	VT-M140A/M141A/M140AW
FEATURES	HQ (HIGH QUALITY)		USED	USED
	COMB FILTER		USED	USED
	NUMBER OF CHANNELS		155 CH	181 CH
	CHANNEL PRESET		F.S. AUTO TUNING	F.S. AUTO TUNING
	CHANNEL SELECT		UP/DOWN / 10-KEY	UP/DOWN / 10-KEY
	CATV/NOR. SELECT (REMOTE)		YES	YES
	TIMER REC PROGRAM		4 PROGRAMS/1 YEAR	8 PROGRAMS/1 YEAR
	TIMER BACK-UP		ABOUT 5 SECONDS	ABOUT 5 SECONDS
	MODE DISPALY		OSD/FL DISPLAY	OSD/FL DISPLAY
	TIMER PROGRAMMING		OSD (BY REMOTE CONTROL)	OSD (BY REMOTE CONTROL)
	CHANNEL TUNING		REMOTE CONTROL	REMOTE CONTROL
	CLOCK SETTING		OSD (BY REMOTE CONTROL)	OSD (BY REMOTE CONTROL)
	TV SELECT BUTTON		YES (BY REMOTE CONTROL)	YES (BY REMOTE CONTROL)
	UHF ANTENNA TERMINAL		PROVIDED	NOT PROVIDED
	IRT START BUTTON		NO	NO
	IRT LENGTH BUTTON		YES	YES
	COUNTER DISPLAY		OSD	OSD
	SCANAPLAY INDEX		NO	NO
	A/V INPUT SELECTOR		NO (JACK TERMINAL)	YES
	PICTURE CONTROL		NO	NO
	INTELASCAN GUIDE		NO	YES
CHASSIS	BASIC CHASSIS TYPE		PZ	PZ
	VIDEO HEADS		2 HEADS SP, LP, EP: 30μm	2 HEADS SP, LP, EP: 30μm
MAIN CONTROL ICS	VIDEO	LUMINANCE PROCESS	HT4947C (IC201)	HT7225 (IC201) HT7025F(IC201) (M140AW ONLY)
		CHROMA PROCESS	HA11810BNT (IC202)	
		CCD 1H DELAY	MSM7400RS (IC203)	MSM7400RS (IC203)
	AUDIO	AUDIO AMP	LA7297 (IC401)	LA7297 (IC401)
	SERVO	PHASE/SPEED CONT.	HD49747NT (IC601)	HD49747NT (IC601)
		C.FG COMPARATOR	BA6993 (IC602)	BA6993 (IC602)
		CYLINDER MOTER DRIVE	BA6459P (IC1651)	XRA6459P (IC1651)
	TIMER/SYS-CON.	MAIN UP	CXP5058 (IC751)	CXP50116 (IC751)
		LOADING MOTER DRIVE	BA6209U4 (IC753)	BA6209U4 (IC753)
		RESET	S8053-ALB (IC755)	PST529i (IC755)
	OSD	OSD UP	MB90062-106 (IC1401)	μPD6450C-703 (IC1401)
	PUWER SUPPLY	5V REGULATOR	RC78M05E (IC204)	—
		5V REGULATOR	LM340CT2 (IC861)	—
		5V REGULATOR	M5F7805 (IC864)	M5F7805 (IC804)

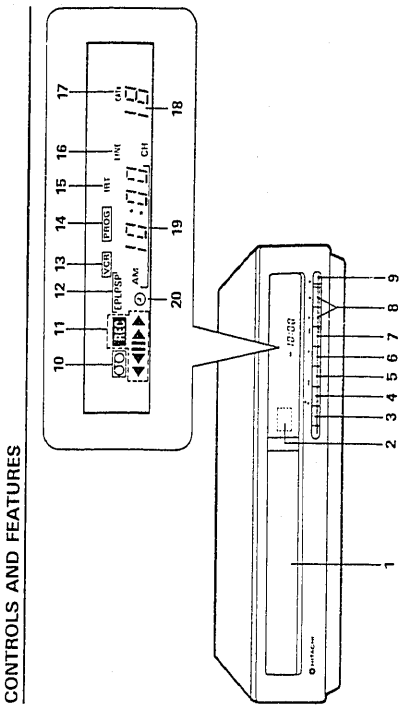
※ Model VT-M131A was produced by changing the VT-M140A as follows.

- Auto head cleaning mechanism omitted
- Insulators omitted
- Remote control changed



20. **TIMER INDICATOR**
Will light when turning power off after programming.
21. **ANTENNA OUTPUT**
Connect this terminal to the antenna terminal on the back of the TV.
22. **AUDIO IN**
Receive audio signals from a stereo system or another VCR.
23. **VIDEO IN**
Receives video signal from a video camera or another VCR.
24. **VIDEO OUT**
For connection to monitor TV.
25. **AUDIO OUT**
For a connection to a monitor or another VCR.
26. **RF CONVERTER SWITCH**
Set this switch to whichever channel (CH3 or CH4) is unused in your area.
27. **ANTENNA INPUT**
Connect the UHF and/or VHF antenna to this terminal.
28. **SIGNAL TRANSMISSION WINDOW**
Transmits an invisible light beam (infrared) from the remote control unit to the VCR.
29. **CATV BUTTON**
First press this button when operating your Cable Converter with this remote control, and then press the button which corresponds to the function you want.
30. **TV BUTTON**
First press this button when operating your TV with this remote control, and then press the button which corresponds to the function you want.
31. **NUMBER BUTTONS "0" THROUGH "9"**
Select any channel (whether or not it is in the "Tuner Scan List") by pressing two buttons. (Press "0" and then "8" for channel 8.) The number buttons are also used for setting the clock and programming the timer.
32. **CHANNEL SELECT BUTTONS**
Same as the buttons on the VCR.
33. **VCR CONTROL BUTTONS**
These buttons (except for "REC" buttons) function same as the buttons on your VCR.
Note: The REC buttons must be pressed simultaneously to start recording.
34. **TAPE SPEED SELECT BUTTON**
Recording time using cassette tape T-160.
EP: 8 hours LP: 6 hours SP: 2 hours
Note: Playback speed automatically corresponds with recorded speed.
35. **TRACKING CONTROL BUTTONS**
To minimize noise in playback. May also be used during visual search to move the noise bars up or down on the screen.
36. **FRAME ADVANCE BUTTON**
Press to view tape one frame at a time.
Operates only after PAUSE button has been pressed.
37. **PAUSE BUTTON**
Press to pause during recording or playback.
38. **TV CONTROL BUTTONS**
Used for controlling the TV.
You need not press the TV button before pressing these buttons.
39. **100/ENT BUTTON**
Used to select TV channels.
Press "100", "2", "3" in this order to select channel 123.
Press "100", "0" and "5" for channel 105.
40. **CLEAR BUTTON**
Used for programming the timer.
And also used for counter reset button.
41. **DISPLAY BUTTON**
1st Press .... Calls up the mode display on TV screen.
2nd Press .... Defeats the display function. Useful to prevent recording the On-Screen-Display. Also changes the VCR's display from the clock to the tape counter.
3rd Press .... Does not change the display on the TV screen at all. Changes the VCR's display from the counter to the clock.
42. **EJECT BUTTON**
When this button is pressed in modes other than recording, the tape stops, and the cassette is ejected.

CONTROLS AND FEATURES



1. **CASSETTE COMPARTMENT**
Insert a cassette in through a door, and loading will be completed automatically.
Note: Power is turned on automatically when the cassette is loaded.
2. **INFRARED RAY RECEIVING SECTION**
Receives the infrared ray from remote control unit.
3. **POWER BUTTON**
Turn system power on and off.
4. **STOP/EJECT BUTTON**
If this button is pressed, while the set is operating, the running of tape stops and all operating modes are cancelled (except for timer recording). The cassette is ejected, when this button is pressed again in STOP mode.
Note: Power may be on or off when removing the cassette.
5. **REWIND/VISUAL SEARCH BUTTON**
Press to start rewind.
Press this button during playback, and reverse playback picture at high speed can be seen.
6. **PLAY BUTTON**
Press to start play.
Note: When the cassette (with erase prevention tab removed) is loaded, playback starts automatically.
7. **FAST FORWARD/VISUAL SEARCH BUTTON**
Press to activate fast forward.
Press this button during playback, and forward playback picture at high speed can be seen.
8. **CHANNEL SELECT BUTTONS**
Select the channels you wish to view or to record by pressing these buttons.
And you can also select "LINE" by pressing these buttons to record or watch the program input at the VIDEO IN and AUDIO IN.
("One channel position either higher or lower outside the range of your preset channels.)
9. **RECORD/IRT BUTTON**
Press to start recording.
10. **TAPE-IN INDICATOR**
Lights when cassette is loaded in the compartment.
11. **VCR MODE INDICATOR**
- [REC] appears during recording.
- ◁◁ appears during the rewind mode.
- ▷▷ appears during the fast-forward mode.
- ▷ appears during the playback.
- ▯▯ appears when the PAUSE button is pressed during record or play mode and disappears when the PAUSE button is pressed again.

12. **TAPE SPEED INDICATORS**
13. **[VCR] INDICATOR**
Appears when the VCR is turned on or the VCR is in the playback mode.
14. **[PROG] INDICATOR**
Lights if any program is in the timer.
15. **IRT INDICATOR**
Lights during programming the IRT program and after programming.
16. **LINE INDICATOR**
Lights when you select the LINE position by pressing the AVX button or CHANNEL select button. LINE position is used to record or watch the program input at the VIDEO IN and AUDIO IN.
17. **CATV INDICATOR**
"CATV" appears in the display when viewing or recording CATV channels. "CATV" disappears from the display when viewing or recording NORMAL channels. See page 18 for details.
18. **CHANNEL INDICATOR**
19. **CLOCK DISPLAY**
Shows the clock and tape counter.

43. INTELASCAN GUIDE BUTTON
Press this button to use the Intelascan feature. (See page 2 for details.)

44. VCR/TV SELECT BUTTON
Selects the signal to be viewed.
The VCR indicator comes on when the unit is in VCR mode and the signal received by the VCR is displayed on the TV screen. With the switch in the TV position (indicator light off) the broadcast signal is received directly by your TV set. When the VCR power is turned off, the VCR automatically switches to "TV".

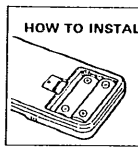
45. POWER BUTTON
Press to turn VCR on. Press again to turn VCR off.

46. VCR BUTTON
First press this button when operating the VCR with this remote control and then press the button which corresponds to the function you want.

47. AVX BUTTON
Press to select tuner position to record or view an off-the-air TV program (through the VCR's built-in tuner) or the "LINE" position to record or view the program input through the video and audio line input jacks.

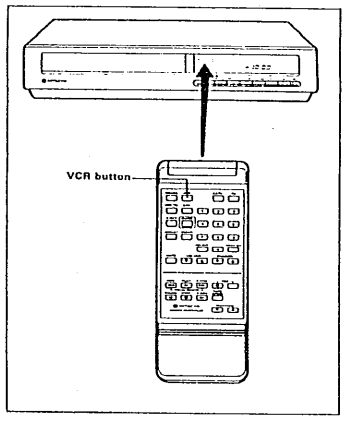
■ USING THE REMOTE CONTROL UNIT

HOW TO INSTALL BATTERIES



NOTES:
1. Be sure to install two "AA" size batteries before use.
2. Be aware of the polarity.

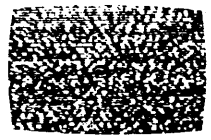
Aim the remote control at the receiver on the front panel of the VCR.



NOTES:
1. If the range is short, try new batteries.
2. An object in between the VCR and remote control unit may block the invisible light beam and operation will not be possible.
3. If you cannot operate the VCR with this remote control, first press the VCR button and then press the button which corresponds to the VCR function you want.

HEAD CLEANING (Not used M131A)

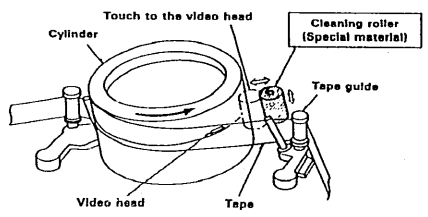
- Picture playback may become blurred or be interrupted while the TV program received is clear. This does not mean that the recorded program has been erased. (See figure below.)
- Dirt accumulated on the head after long periods of use causes this problem. Since this VCR uses an auto head cleaning system, dirt does not often adhere to the heads.
  When it is difficult to remove dirt using this system, head cleaning requiring highly technical care is necessary.
- Video heads rotate rapidly and are easily damaged if they contact objects other than video tape. Under most conditions, they tend to be self cleaning due to contact with the tape. If the video heads become dirty, the picture will become snowy. Only when the picture becomes snowy and the tracking control has no effect, should the heads be cleaned.
  Head Cleaning Cassettes are available in the marketplace for customer use, but the quality and effectiveness of these Cleaning Cassettes ranges from satisfactory to poor. Some cleaning cassettes increase head wear or cause damage to the video heads. Others may become stuck in the machine.
  We recommend that head cleaning be performed only by qualified video recorder technicians. Head cleaning or malfunctions caused by head cleaning is not covered by the Limited Warranty.



Example of playback with dirty video heads

Auto Head Cleaning System

This system cleans the video heads automatically when recording or playback starts and finishes to prevent dirt from accumulating on the heads.
NOTE: Mechanical sound is heard during head cleaning.



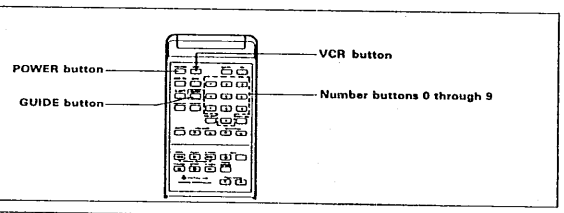
PERIODIC MAINTENANCE

The VCR is a precision electromechanical device which will require periodic maintenance after a period of normal use. We expect that no maintenance other than head cleaning will be required during the warranty period by most users, unless the VCR is heavily used or seldom used. Normal maintenance is the responsibility of the user, although defective parts are covered during the warranty period. Consult your VCR Service Center to determine recommendations for normal maintenance based on your location, use patterns and machine age.

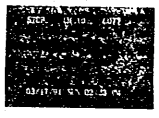
SETTING THE CLOCK

Things to know before starting

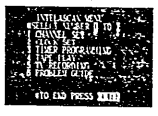
- The clock uses the 12-hour system. (Be aware of AM and PM.)
- When you first plug in your VCR, the clock will read "– – : – –".
- The Buttons for setting the clock are on the remote control unit.
- While you are setting the clock, the "menu" display on the TV screen will prompt you through the procedures.
- If you press a wrong digit, press the CLEAR button repeatedly until the digit to be corrected flashes and then enter the correct digit.



1. Turn on the power of both VCR and TV.
2. Be sure that the TV is set to the video channel (channel 3 or 4).
3. Aim the remote control unit at the receiver on the front panel of the VCR.



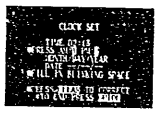
4. Press the GUIDE button on the remote control unit until the "MENU", as illustrated, appears on the TV screen.
   NOTE: If the menu does not appear when the GUIDE button is pressed, press the VCR button and then the GUIDE button.



Original menu

5. Press "2" button to set the clock. The display prompts you to set the hour.

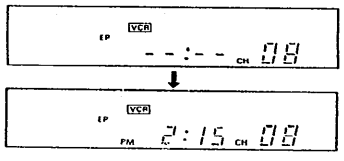
6. Set the hour by pressing two number buttons on the remote control unit and two more for the minute (for example, 0 2 1 5 for 2:15). The display prompts you to select AM or PM.



7. Press "1" for AM or "2" for PM. The display flashes and prompts you to set the date.

8. Set the date by pressing six digits in order of month, day and year (for example, 0 3 1 7 9 1 for March 17, 1991). The day of the week will appear when you have entered all six digits for the date.
   NOTE: Always press "0" before single-digit months and days.

9. Press GUIDE button to start the clock. The display resumes the "original menu".
   NOTE: Now the display on the VCR will show the correct time.

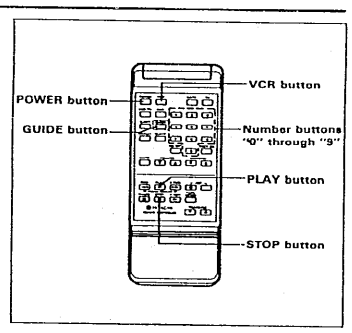


10. Press GUIDE button once again to return to the TV screen.

NOTES:
1. If you input an illogical time or date (13th month for example), this will not be accepted .
2. The clock must be set to the correct time before programming the timer for unattended recording or using the Instant Recording Timer (IRT) feature.
3. The display of Clock Setting procedures will resume the "original menu" if not further steps are followed in the setting for about 1 minute.
4. If power is interrupted for more than 5 seconds, "– – : – –" will appear on the display and Timer and Programming will need to be reset.

CHANNEL TUNING

The automatic programming feature makes it easy and convenient to program the TV station into the tuner's memory.
Automatic programming is usually a "one-time" procedure, but you will need to repeat it if you move to a location that has different channels.



1. Turn on the power of both VCR and TV.
2. Be sure that the TV is set to the video channel (channel 3 or 4).
3. Aim the remote control unit at the receiver on the front panel of the VCR.

4. Press the GUIDE button on the remote control unit until the "MENU", as illustrated, appears on the TV screen.
   NOTE: If the menu does not appear when the GUIDE button is pressed, press the VCR button and then the GUIDE button.

Original menu

5. Press button "1" for channel setting. The channel setting "MENU" appears on the TV screen.

6. Press button "1" to select "NORMAL" or "CATV".
   If your VCR is connected to a home antenna system, select "NORMAL"; select "CATV" when your VCR is connected to a cable antenna. Switching is performed between "NORMAL" and "CATV" on the TV screen every time button "1" is pressed. If you select "CATV", "CATV" appears in the VCR display, and if you select "NORMAL", "CATV" disappears.

7. Press "2" button.
   The tuner will automatically cycle through all available channels in the area and place them in the tuner's memory. It takes about 50 seconds.
   The channel number will stop changing when the tuner is finished cycling. Programming is now completed. You can select the active channels by pressing the CHANNEL select buttons.

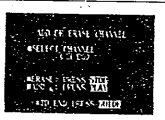
■ Eliminating unwanted preset channels

You may want to have only a few favorite channels in the tuner's memory so you can select them more quickly with the CHANNEL select button.
Occasionally automatic programming may include a vacant channel in the tuner's memory if there happened to be some sort of "noise" or "stray signal" on the channel when the tuner was programmed. This procedure explains how to delete any unwanted channels from the tuner's memory.

1. Follow steps 1 through 5 of "Channel Tuning"
   The channel tuning "menu" appears on the TV screen.

2. Press "3". The "menu", as illustrated, will appear on the TV screen.

3. Select the channel number by pressing buttons "0" through "9". (Press "0" and then "8" for channel 8.)
   Press the PLAY button to add channels and the STOP button to erase channels.
   Perform the same procedure to add or erase other channel numbers.
   NOTE: Erased channels cannot be selected by the CHANNEL button, but can be selected by buttons "0" through "9".



NOTE: If you view and record one or more local UHF channels that your cable system does not offer, first, program the cable-TV channels. Then preset the desired UHF channels by following the "Adding channels to the tuner's memory" after selecting the "NORMAL".

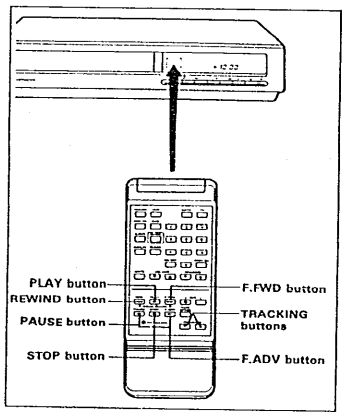
■ Adding channels to the tuner's memory

You may have deleted a channel from the tuner's memory and want to put it back. Occasionally automatic programming may "miss" an active channel because the signal is very weak or because the channel happened to be "off the air" when the tuner was programmed. Use this procedure to add any channel in the memory.

Your VCR is capable of receiving "off-the-air" TV channels (VHF 02 — 13, UHF 14 — 69) and CATV channels 01 — 125, a total of 181 channels*.

* You can receive channels 02 — 13 on both "off-the-air" and "cable" channels. Therefore, the total number of channels including "off-the-air" and "cable" channels is 181 channels (12 + 56 + 125 — 12 = 181).

PLAYBACK



1. Insert the cassette.
   VCR power is turned on automatically.
   Note: When the cassette (with erase prevention tab removed) is loaded, the playback starts automatically.
2. Turn the TV on and select the video channel.
3. Press the PLAY button.
4. Press the STOP button to stop playback.

Tracking control adjustment
When playing prerecorded tapes or those recorded on units other than your own, black and white streaks may appear on your TV screen. If this occurs, press either TRACKING control button (▼ or ▲) until the streaks disappear.

Still playback
When the PAUSE button is pressed during playback, a still picture can be seen. To start again press PAUSE button and the VCR will continue playback.

Notes:
- There will be some noise (interference) in the still pictures.
- When the still mode continues for about more than 5 minutes, the VCR will automatically change to stop mode to protect the tape.
- If vertical jitter (shaking) occurs during the still mode, press either TRACKING control button (▲ or ▼) (one by one) to minimize it.

Frame Advance
When you press F.ADV button on the remote control unit during Still (play-pause) mode, one frame at a time can be seen.
Operates only after PAUSE button has been pressed.

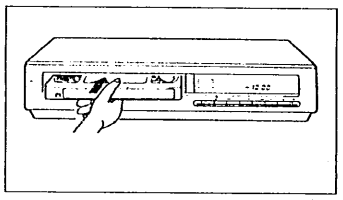
Visual search
This allows you to view the picture from a recorded tape at high speed in both the forward and reverse directions.
Press the PLAY button to play a tape, then press either the VISUAL SEARCH button REW or F.FWD. Pictures can be viewed at high speed in either the forward or reverse direction.
Press the button again (or press PLAY) to return to normal playback.
Note: The playback picture will have some noise in the visual search mode.

Automatic rewind
The tape will stop and automatically rewind when the end of the tape is reached.
This function does not operate during timer recording and instant recording.

Rewind shut off
If power button is pressed during rewind operation, power will be turned off automatically after the tape has been completely rewound.

TIMER RECORDING

The programmable electronic clock/timer permits the unattended recording of up to 8 preselected programs, including one program on the same day of each week or one program at the same time every day.
It can be preset up to 1 year in advance to record your favorite programs. It turns the unit on and off and changes channels automatically.



1. Insert the Cassette.
2. Press the SPEED button to select "SP", "LP" or "EP".
3. Set the program timer.
   "START (ON) TIME", "STOP (OFF) TIME", "DAY" etc. See below.
4. Turn power off. Now recording will begin automatically at the start time.

Notes:
- It is not necessary to press RECORD button.
- The TIMER indicator flashes to warn that recording will not occur because cassette has not been inserted. If the safety tab on the cassette has been removed, the VCR will automatically eject the cassette when placed in the Timer mode.

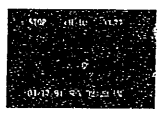
■ Programming the timer for unattended recording

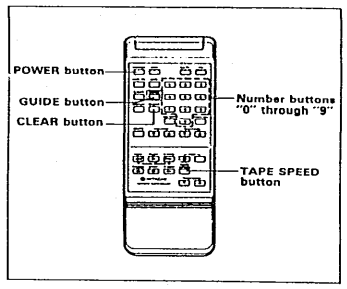
For unattended recording the timer needs to know what day to make the recording, the time to start, the time to stop, and the channel to be recorded.

Things to know before starting

- While you are programming the timer, the "menu" display on the TV screen will prompt you through the procedures.
- You can correct an error in the program any time before the last step by pressing CLEAR button repeatedly until the digit to be corrected becomes flashing and then enter the correct digit.
- The programming will automatically resume the "original menu" if no further steps are followed in programming for about 1 minute.
- The "original menu" will be switched to the TV screen automatically if it is left on without further steps for about 1 minute.

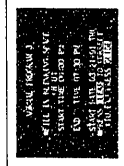
1. Turn on the power of both VCR and TV.
2. Be sure that the TV is set to the video channel (channel 3 or 4).
3. Aim the remote control unit at the receiver on the front panel of the VCR.



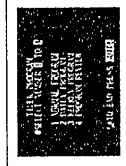


10. Press four digits, two for the hour and two more for the minute (for example, "0" "7" "3" "0" for 7:30). The display will prompt you to select the date.

11. Press four digits (two for the month and two for the day) (for example, "0" "3" "2" "1" for begin recording on March 21). The year and day of the week are displayed automatically.

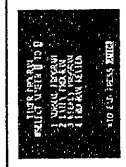


12. Press the GUIDE button to enter your program and return to the programming "menu" display. Additional programs may be entered by repeating Steps 6 through 11.
If you have no other programs to enter, press the GUIDE button twice.
The display returns to the TV screen.

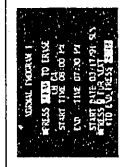


RECALLING THE PROGRAM

1. Follow Steps 1 through 5 of "Programming the timer for unattended recording".
The programming "menu" appears on the TV screen.



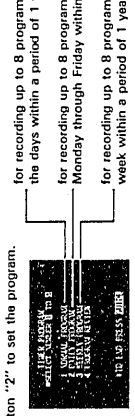
2. Press "4" button (Program Review).
The TV screen will display for 10 seconds the information you entered for the lowest program number. Then the display changes to the next higher program number and so on, until all program information has been displayed.
3. Press "4" again if you want to view the next program information immediately.
4. When you finish reviewing the programs, press the GUIDE button three times to switch off the on-screen display.



TIMER RECORDING (cont)

4. Press the GUIDE button on the remote control unit until the "menu", as illustrated, appears on the TV.

5. Press button "2" to set the program.



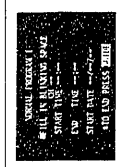
for recording up to 8 programs on a single day or over the days within a period of 1 year.

for recording up to 8 programs at the same time(s) Monday through Friday within a period of 1 year.

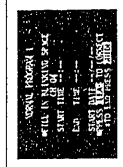
for recording up to 8 programs on certain days of every week within a period of 1 year.

Note: Any one of these program modes or any combination thereof (up to 8 programs in total) may be selected. A typical example of a "Normal" program is demonstrated below.

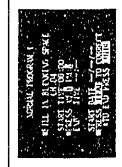
6. Press button "1". The display will prompt you to select the channel to be recorded.



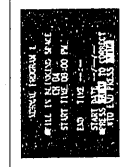
7. Press two digits for the channel to be recorded (for example, "0" "4" for channel 4). The display will prompt you to enter the recording start time.



8. Press four digits, two for the hour and two more for a minute (for example, "0" "6" "0" "0" for 6:00). The display will prompt you to select either AM or PM.
Note: Always press "0" before a single digit hour and minute.



9. Press "1" for AM or "2" for PM. The display will prompt you to select the stopping time.



DISASSEMBLY

1. NAMES AND LOCATIONS OF CIRCUIT BOARDS

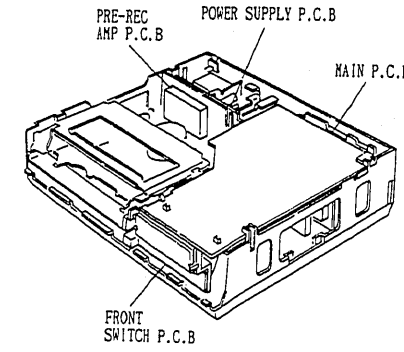


Fig. 1-1 Top View

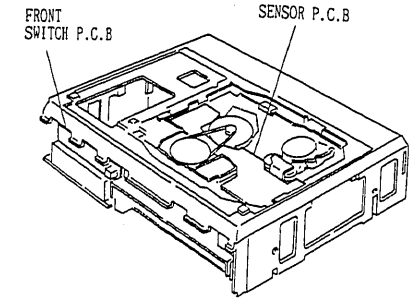


Fig. 1-2 Bottom View

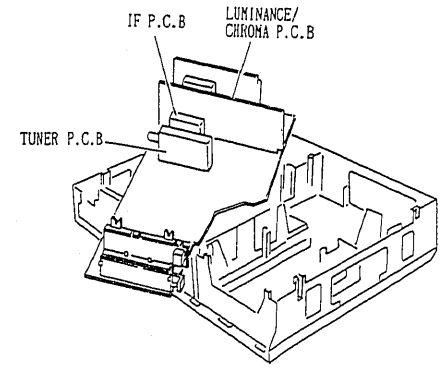


Fig. 1-3 State with Main P.C.B Opened

(Procedure when removing)
Remove the components in the order of letters (A, B, C ...) in the illustrations.

(Procedure when reinstalling)
Reinstall the components by the reverse procedure to removal when not otherwise specified.

2. CASE REMOVAL

1. Top Cover (Fig. 2-1)

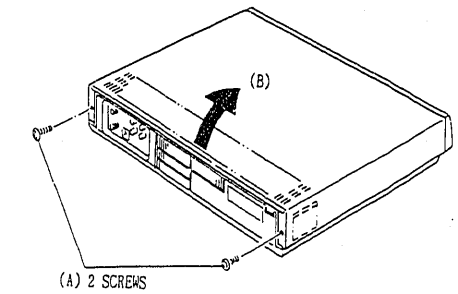


Fig. 2-1

2. Bottom Cover (Fig. 2-2)

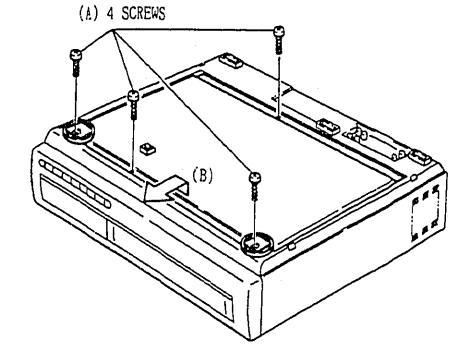


Fig. 2-2

3. Front Panel (Fig. 2-3)

Components to remove previously	Item
Top Cover	2-1
Bottom Cover	2-2

(Caution when reinstalling)
- Reinstall the front panel with the cassette door pushed in halfway so that the boss of the door arm is in front of the cassette door.

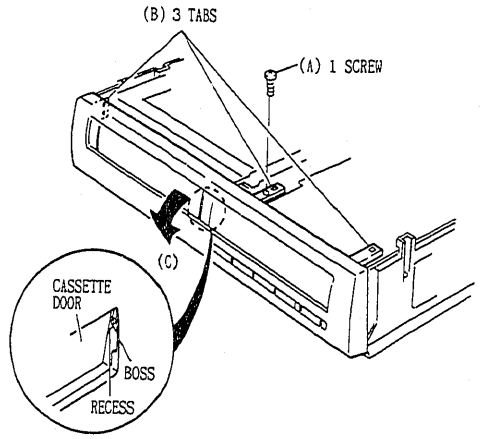


Fig. 2-3

4. Cassette Door (Fig. 2-4)

Components to remove previously	Item
Top Cover	2-1
Bottom Cover	2-2
Front Panel	2-3

1) Release the cassette door stopper.
2) Lift the cassette door and slide it in the direction of arrow (B) to remove it.

(Caution when reinstalling)
- Reinstall the spring at the right of the cassette door firmly.

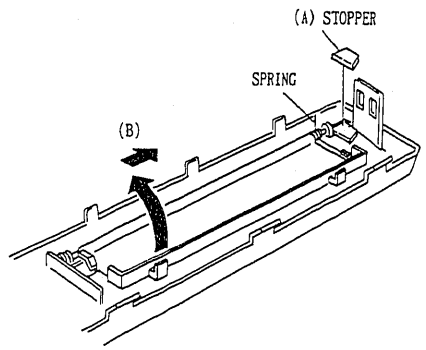


Fig. 2-4

Be sure to remove cases when servicing and checking the circuit boards.
- Top Cover (see item 2-1)
- Bottom Cover (see item 2-2)
- Front Panel (see item 2-3)

3. CIRCUIT BOARD REMOVAL
1. Main (Servo/System Control/Jack) Circuit Board (Fig. 3-1)

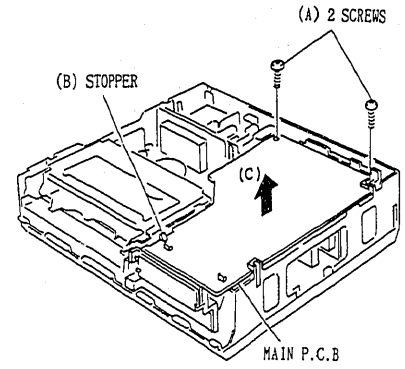


Fig. 3-1

(Rear Panel Removal)
- Remove one (1) screw on the rear panel while lifting the main circuit board and pull out the rear panel backwards.

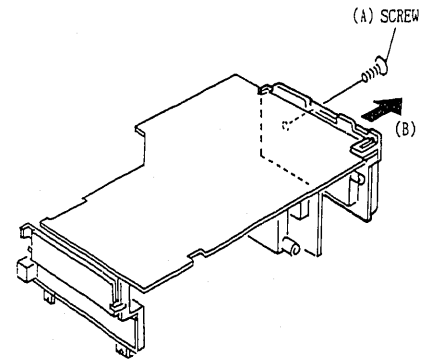


Fig. 3-2 Rear Panel Removal

2. Luminance/Chroma and FRONT Switch Circuit Boards (Fig. 3-3)

(Before removing)
1) Remove the main citcuit board. (Sceitem 2)

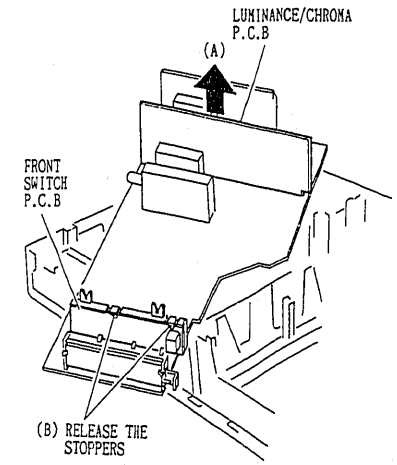


Fig. 3-3

3. Power Supply Circuit Board (Fig. 3-4)

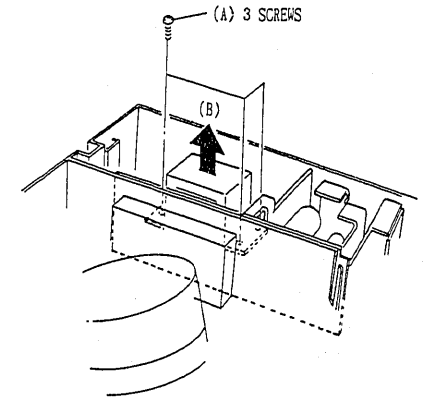


Fig. 3-4

4. Sensor Circuit Board (Fig. 3-5)

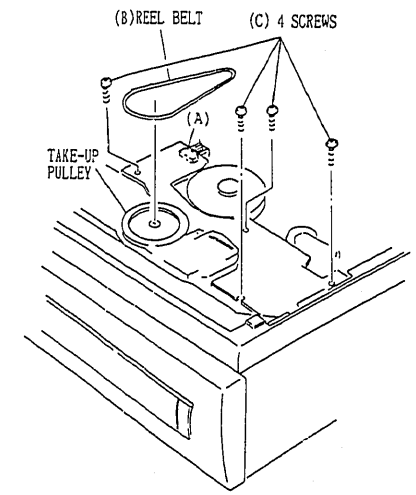


Fig. 3-5

5. IF and Tuner Circuit Boards (Fig. 3-6)

(Before removing)
1) Remove the main circuit board. (See item 2)

(How to remove)
Unsolder the connection terminals from the solder side of the main circuit board and then remove theIF and tuner circuit boards.

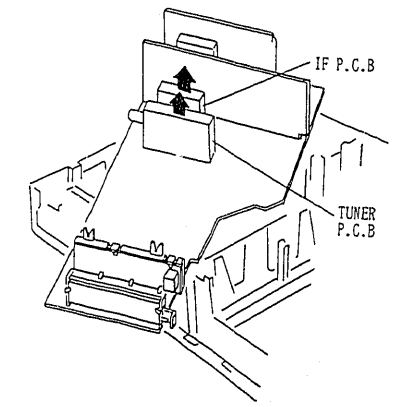


Fig. 3-6

Refer to the VT-M240A/M241A service manual (No. 3265E) for the names and locations of the main mechanical components and removal of the mechanical components.

CHAPTER 3

ELECTRICAL ADJUSTMENT

Test equipment necessary for adjustment

- Dual-trace oscilloscope
  - ·Bandwidth : 10MHz or more
  - ·Probe : 10 : 1
- Color bar generator (NTSC)
- DC voltmeter
- Moniter TV
- Alignmet tapes
  - ·MH-1 (Parts No.7099046)
  - ·30HMP2-1 (Parts No.7099089)
- Blank tape

Before starting adjustment

- Remove the top cover
- Adjust the Main Circuit boards from the solder side and Luminance/Chroma Circuit boards from the component side and Tuner IF unit from the component side.

To set tracking to the center

- When "Tracking control : Center position" is specified, center the tracking as follows. (Press tracking button (▼ or ▲) on the remote control unit simultaneous)

1. SERVICE POSITION

1) Main Circuit Board

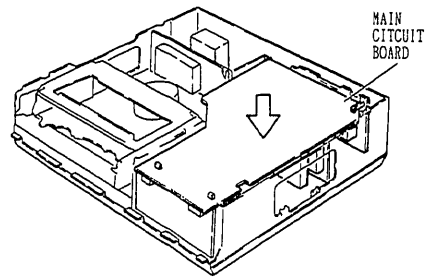


Fig. 4-1

2) Luminance/Chroma Circuit Board, Tuner IF Unit

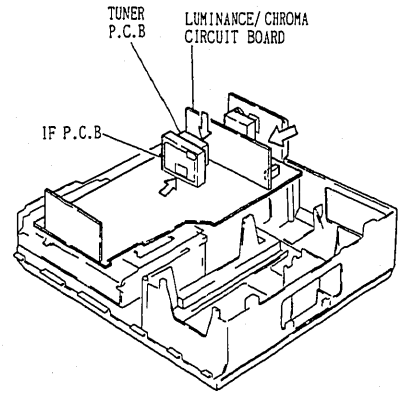


Fig. 4-2

2. ADJUSTMENT PARTS LOCATION

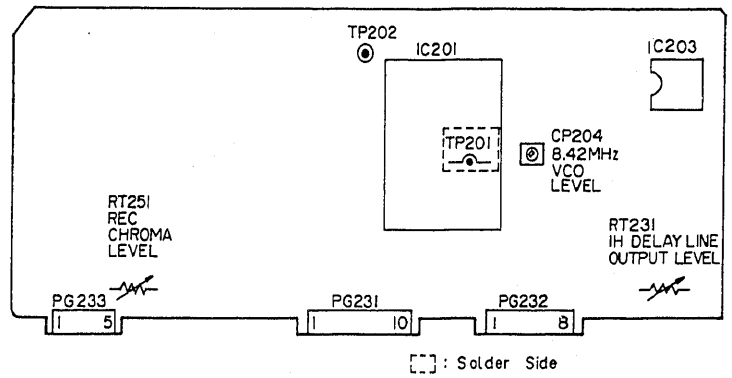


Fig. 4-3 Luminance/Chroma Circuit Board
(Components Side)

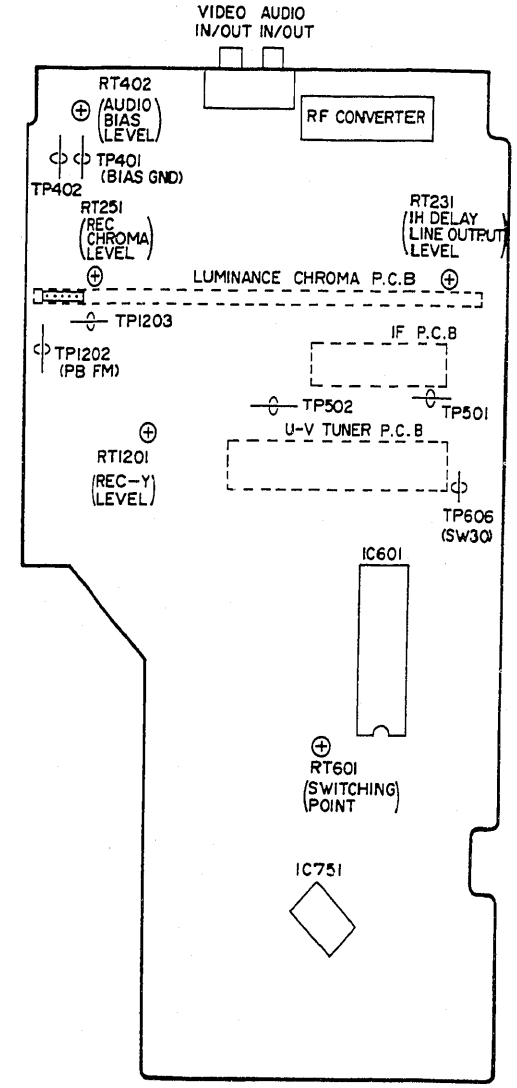


Fig. 4-4 Main Circuit Board
(Solder Side)

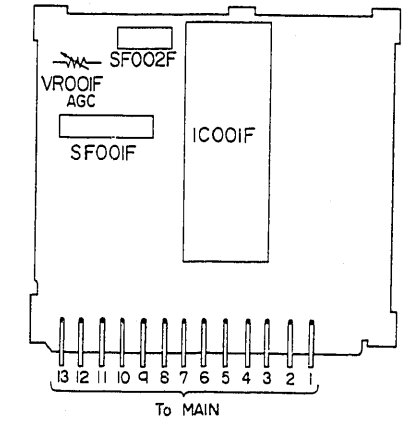


Fig. 4-5 IF P.C.B
(Components)

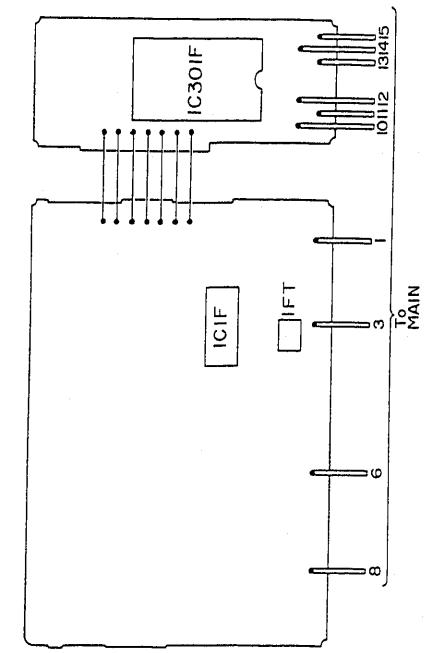
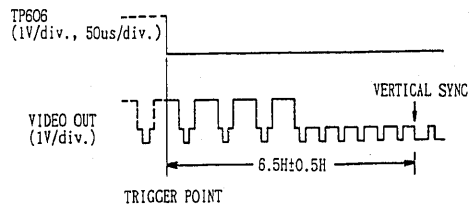


Fig. 4-6 Tuner P.C.B
(Components Side)

3. ADJUSTMENT POINTS

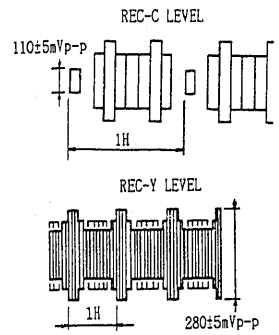
3-1 MAIN CIRCUIT (Servo Section)

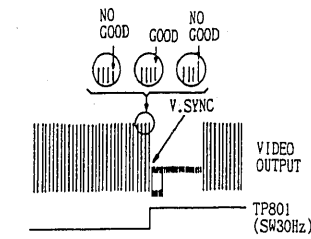
No	Item	State of Unit	Test Point	Adj. Point	Adjustment Procedure
1	Switching Point Adjustment	·SP mode ·Play a NTSC alignment tape ·Tracking control: Center	·Video output jack ·TP606 (SW30Hz)	·RT601	1) Set the sync slope switch of the oscilloscope to "⎯". 2) Adjust RT601 so the leading edgeat TP606(SW30) is 6.5±0.5H before the front porch of the vertical sync signal.
	(Waveforms)  Fig. 4-7				(Alignment tape used) ·NTSC : MH-1 (Parts No.7099046)

3-2 MAIN CIRCUIT (Audio Section)

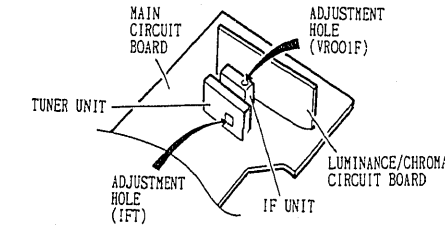
No	Item	State of Unit	Test Point	Adj. Point	Adjustment Procedure
1	Audio Bias Level Adjustment	·REC mode ·SP mode	·TP402 ·TP401 (BIAS GND)	·RT402	1) Connect a VTVM to TP402 and TP401 (GND). 2) Adjust RT402 so the bias level is 2.3±0.1mV
	(Caution during adjustment) ·Perform adjustment without applying a video or audio signal.				

3-3 LUMINANCE/CHROMA CIRCUIT

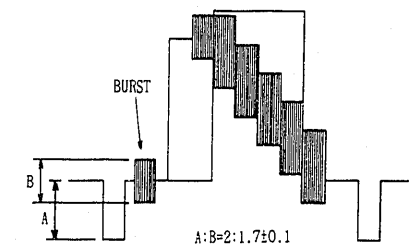
No	Item	State of Unit	Test Point	Adj. Point	Adjustment Procedure
1	8.42MHz VCO Level Adjustment	·E-E mode ·Color bar signal input	·TP201	·CP204	1) Connect a VTVM between TP201 and ground. 2) Adjust the 8.42MHz VCO level (CP204) so the DC level is 2.35± 0.05V.
2	Record chroma Level Adjustment	·Color bar signal input ·EP mode ·REC mode	·PG833-2 TP1203	·RT251 ·RT1201	1) Connect a oscillscope between PG833-2 and ground. 2) Adjust the Record Chrom Level Control (RT251) so that the color burst level is 110±5mV. 3) RT1201 : Set the luminance recording level to 280mV±5mVp-p.
	(Waveforms)  Fig. 4-8				

No	Item	State of Unit	Test Point	Adj. Point	Adjustment Procedure
3	1H Delay Line Output Level Adjustment	·Play NTSC alignment tape	·TP606 (SW30Hz) ·Video output jack	·RT231 ·RT601	1) Adjust RT601 to match the phase of the leading edge of the pulse at TP606 (SW30) and the phase of the V.SYNC signal. 2) Adjust the 1H Delay Line Out Level control (RT231) so that the amplitude (height) of the last H.sync signal is equal to the heights of the other signals. 3) After completing adjustment in step 2, adjust RT601 to set the switching point to 6.5H±0.5H.
	(Waveforms)  Fig. 4-9				

3-4 IF CIRCUIT

No	Item	State of Unit	Test Point	Adj. Point	Adjustment Procedure
1	AGC Adjustment	·NTSC color bar signal input	·TP501	·VR001F	1) Supply a 199.25MHz/-39dbm of RF NTSC color bar signal with 87.5% modulation to the VHF antenna terminal. 2) Tune is the RF channel supplied by the NTSC color bar generator (select channel 11). 3) Connect a DVM to the TP501 on the main circuit board. 4) Adjust the AGC control (VR001F) for 5.3±0.1V DC.
	(Adjust Point)  Fig. 4-10				

3-5 TUNER CIRCUIT

No	Item	State of Unit	Test Point	Adj. Point	Adjustment Procedure
1	IFT Adjustment	·NTSC color bar signal input	·TP502	·IFT	1) Tune in the RF channel upplied by NTSC color bar generator (Select channel 11). 2) Connect a scope probe to the TP502 on the main circuit board. 3) Adjust the core of the IFT so the ration between SYNC level (A) and burst level (B) is 2 :1.7±0.1 as shown in Fig. Fig.4-11 Note : Check that the yellow level of the chroma signal does not exceeds the 100% white level. IF itdoes, readjust the core.
	(Waveforms)  Fig. 4-11 (Adjust Point : See Fig.4-10)				

Refer to the VT-M240A (No. 3265E) for the mechanism adjustments except the X-value adjustment and adjustment after the cylinder (video heads) is replaced.

6. X Value Adjustment

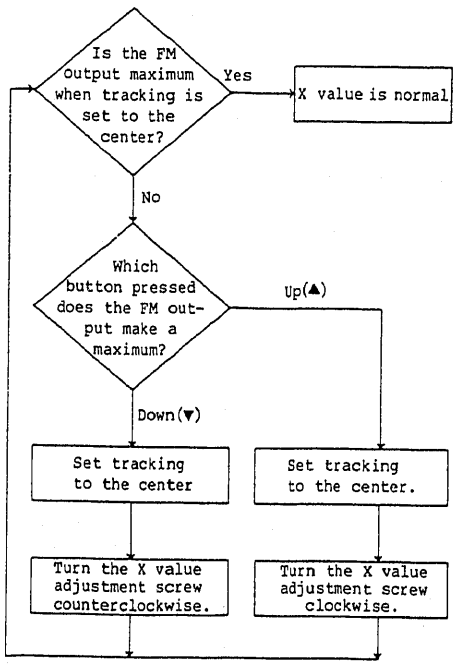
Purpose: To make compatible with other VTRs.

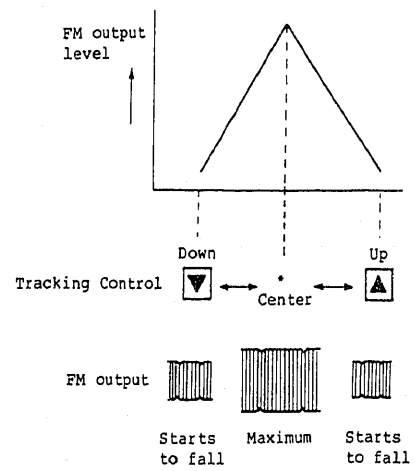
Test Equipment/Jigs	Test Equipment Connection Points	State of VTR	Adjustment Point
o Oscilloscope	o CH-1: TP1202 (PB FM) o CH-2: TP606 (SW 30Hz)	o Play alignment tape (step waveform if MH-1 alignment tape is used).	o X value adjustment screw
o Aligment tapes (Parts No.7099046) (Parts No.7099089) o 1.5mm hexagonal wrench	——		

Connection diagram
See page 4-4 for the connection of test equipment.

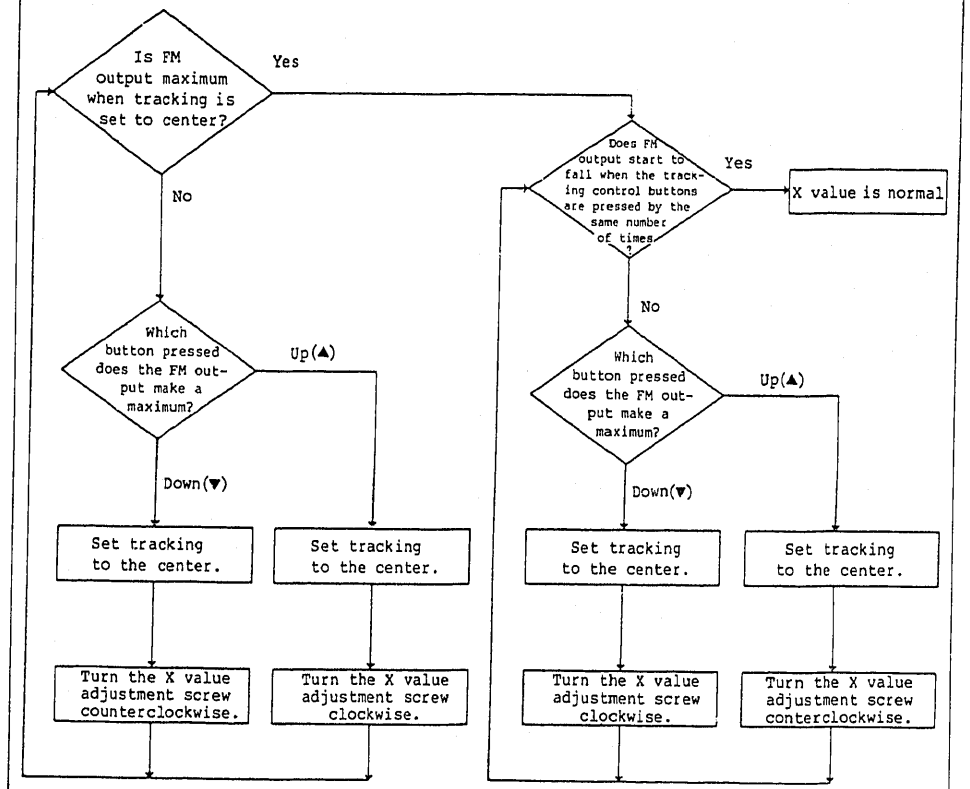
Adjustment procedure
(Adjustment using 30HMP2-1 alignment tape)
Adjust so that the FM output is maximum when the tracking is at the center.

Note: To set tracking to the center position
o Press the EJECT button to remove the alignment tape and re-insert it.

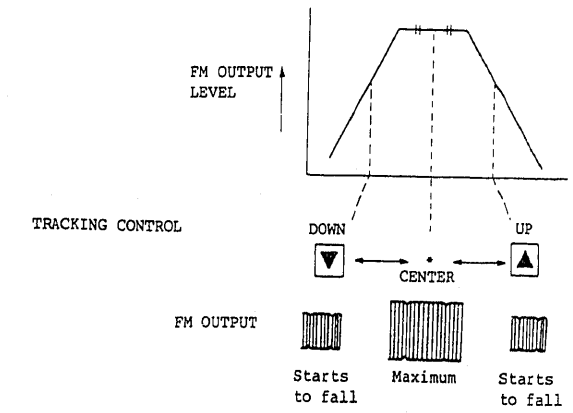

Is the FM output maximum when tracking is set to the center?
Yes
X value is normal
No
Which button pressed does the FM output make a maximum?
Up(▲)
Down(▼)
Set tracking to the center
Set tracking to the center.
Turn the X value adjustment screw counterclockwise.
Turn the X value adjustment screw clockwise.



Adjustment procedure
(Adjustment using MH-1 alignment tape)
Adjust so that the FM output is maximum when tracking is set to the center.
Then press the tracking control buttons and adjust so that the FM output starts to fall when both buttons are pressed by the same number of times.


Is FM output maximum when tracking is set to center?
Yes
No
Does FM output start to fall when the tracking control buttons are pressed by the same number of times?
Yes
X value is normal
No
Which button pressed does the FM output make a maximum?
Up(▲)
Down(▼)
Set tracking to the center.
Set tracking to the center.
Turn the X value adjustment screw counterclockwise.
Turn the X value adjustment screw clockwise.
Which button pressed does the FM output make a maximum?
Up(▲)
Down(▼)
Set tracking to the center.
Set tracking to the center.
Turn the X value adjustment screw clockwise.
Turn the X value adjustment screw conterclockwise.

Adjustment diagram



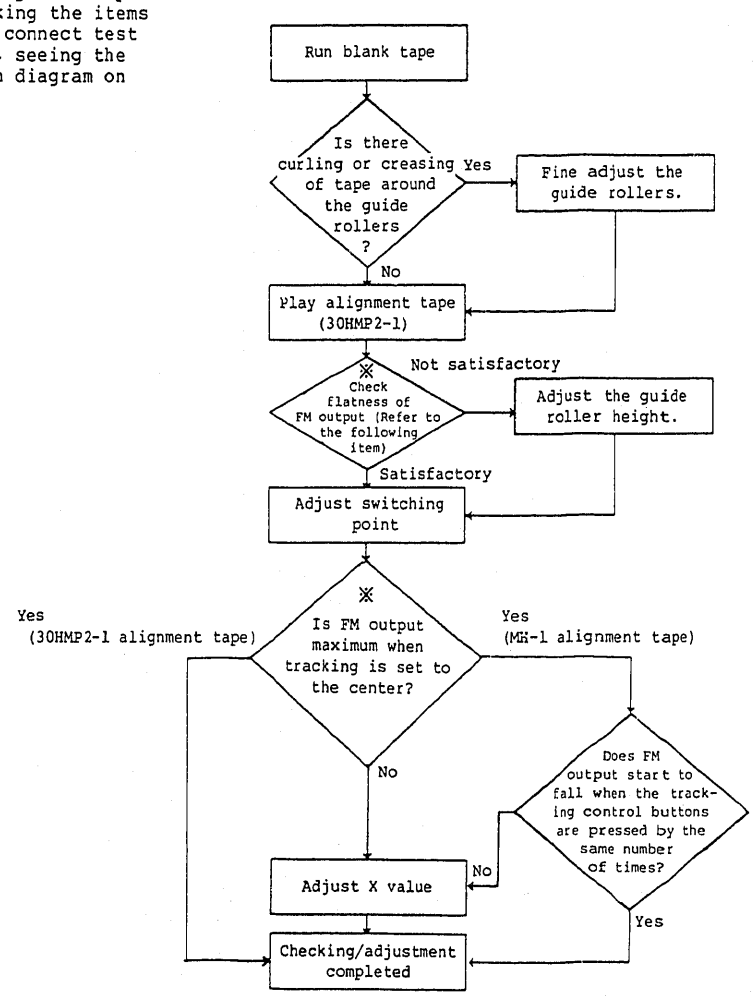
7. Adjustments After Replacing Cylinder (Video Heads)

Purpose: To suppress drift in the height relative to the guide roller and drift of the X value after replacing the cylinder.

Test Equipment/Jigs	Test Equipment Connection Points	State of VTR	Adjustment Points
o Oscilloscope	Checking the flatness o CH-1: TP1202 (PB FM) o CH-2: TP606 (SW 30Hz)	o Run the blank tape o Play alignment tape	o Guide rollers o Switching point o X value (page 4-8)
o Alignment tapes (Parts No.7099046) (Parts No.7099089) o Blank tape o 1.5mm, 0.9mm hexagonal wrench o X value adjustment screwdriver	—		

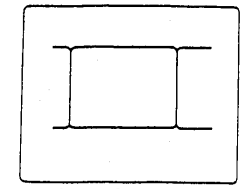
Checking/adjustment procedure

When checking the items marked *, connect test equipment, seeing the connection diagram on page 4-4.

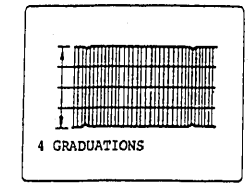

Run blank tape
Is there curling or creasing of tape around the guide rollers ?
Yes
Fine adjust the guide rollers.
No
Play alignment tape (30HMP2-1)
※ Check flatness of FM output (Refer to the following item)
Not satisfactory
Adjust the guide roller height.
Satisfactory
Adjust switching point
※ Is FM output maximum when tracking is set to the center?
Yes (30HMP2-1 alignment tape)
Yes (MH-1 alignment tape)
No
Does FM output start to fall when the tracking control buttons are pressed by the same number of times?
No
Yes
Adjust X value
Checking/adjustment completed

Checking procedure of the flatness and fluctuations of FM output and waveform diagrams

1) Use the tracking control buttons to maximize the FM output.

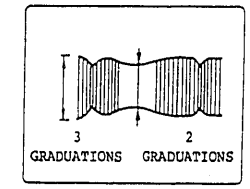


2) Fine tune the voltage level range of the osciloscope to set the FM output to 4 graduations.



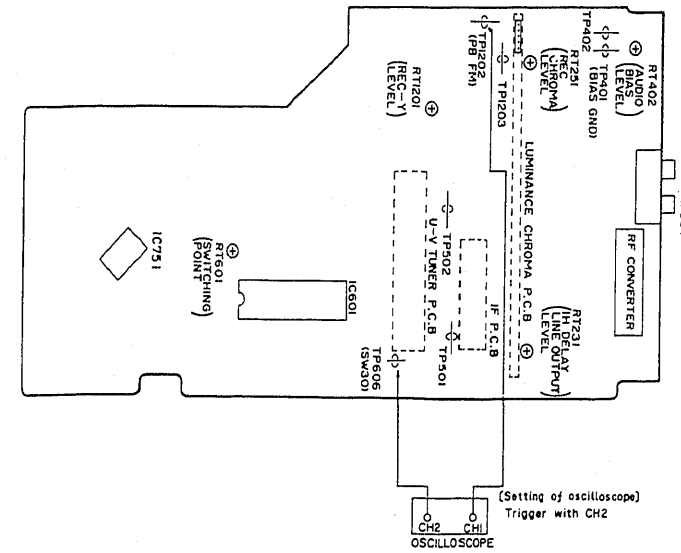
3) Press the tracking control buttons to set maximum amplitude of the FM output to 3 graduations.

4) Check that the minimum amplitude is more than 2 graduations.



5) Check that the level fluctuations between the maximum and minimum amplitudes are less than 13%.

Connection diagram

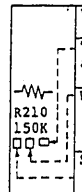


SCHEMATIC/CIRCUIT BOARD DIAGRAMS

BEFORE USING THIS SERVICE REFERENCE MATERIAL

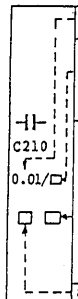
How to read abbreviations

(Resistors)



	Value	Not indicated .. Ω(ohm) K ..... kΩ
	Tolerance	Not indicated .. ±5% K ..... ±10% M ..... ±20%
	Wattage	Not indicated .. 1/8W (All values other than 1/8W are indicated in the schematic diagrams with W omitted)
	Sort	Not indicated .. Carbon film RC ..... Carbon solid RW ..... Wire wound RS ..... Metal oxide film RN ..... Metal film
Example: R120 ..... 150kohm, carbon solid RC1/2K 1/2W, ±10%		

(Capacitors)



	Value	Not indicated .. μF P ..... PF
	Dielectric strength	Not indicated .. 50WV (All values other than 50WV and electrolytic capacitors are indicated in the schematic diagrams with WV omitted)
	Tolerance	Not indicated .. ±10% J ..... ±5% M ..... ±20% C ..... ±0.25PF Z ..... +80% -20% (No tolerance is indicated for electrolytic capacitors (excluding tantalum and high stability electrolytic capacitors))
	Sort	Not indicated .. Ceramic General electrolytic (distinguished from ceramic with circuit symbol) MYL ..... Mylar (polyester film) STY ..... Styrol TA ..... Tantalum KU ..... High stability electrolytic MP ..... Metalized paper
Example: C210 0.01/25 ... Mylar, 0.01μF, 25WV, ±5% MYL J		

Notes:

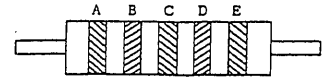
1. Voltages are measured with the negative ⊖ terminal of the power supply as reference in the normal operating mode. The voltages in different modes are indicated in the schematic diagrams; those in parentheses ( ) are in the record mode and those without parentheses are in the play mode.
2. The value, dielectric strength (wattage), tolerance and sort of resistors (excluding variable resistors, etc.) and capacitors are indicated in the schematic diagrams by abbreviations. Replace them correctly, comparing the abbreviations in the schematic diagrams and the table "how to read abbreviations".

Cautions on use of MOS IC

1. The MOS IC is inserted in black foam for shipment. This foam is a conductor which short-circuits between the leads to prevent damage. Do not remove ICs from this foam during their storage. Avoid removing ICs from this foam, placing them on plastic which is likely to be charged with static electricity or inserting them into styrol foam.
2. High voltages may be applied during soldering caused by leakages from the soldering iron, so be sure to ground the tip of the soldering iron or use a low voltage soldering iron.
3. The human body, clothes made of synthetic fibers or nylon gloves may be charged with several thousands volts of static electricity because of friction, so a worker should be grounded.
4. Be sure to ground measuring instruments such as oscilloscopes, VTVMs, etc. used for repairs.

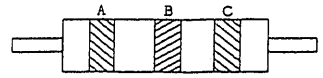
How to read capacity and inductance of resistor shape capacitors and coils

CAPACITOR



CAPACITY: (10A+B) x C (PF)
TOLERANCE: D
RATED VOLTAGE: BODY COLOR
PINK: 25V
GREEN: 50V
CHARACTERISTICS: E

COIL



INDUCTANCE: (10A+B) x C (μH)

COLOR	A,B	C	D	E
Black	0	10^0	±20%	For temperature compensation
Brown	1	10^1		
Red	2	10^2		
Orange	3	10^3		
Yellow	4	10^4		
Green	5	10^5		
Blue	6			
Violet	7			
Gray	8		±30%	High dielectric constant type
White	9			For temperature compensation
Gold		10^{-1}	±5%	
Silver		10^{-2}	±10%	High dielectric constant type

SERVICE MANUAL ABBREVIATION LIST

A	
A.DUB	Audio Dub
ACC	Automatic Color Control
ACK	Automatic Color Killer
ADD	Adder
AFC	Automatic Frequency Control
AGC	Automatic Gain Control
ALC	Automatic Level Control
ASBL	Assemble (Phase Matching)
APC	Automatic Phase Control
AUX	Auxiliary
B	
BATT.	Battery
BG	Burst Gate or Back Ground
BGP	Burst Gate Pulse
BH	Power Supply for Selecting VHF High Band
BL	Power Supply for Selecting VHF Low Band
BPF	Band-pass Filter
BS	Power Supply for Selecting VHF Super Band
BU	Power Supply for Selecting UHF Band
BUF.	Buffer Amplifier
C	
C	Chroma
C.FG/CFG	Capstan Frequency Generater
C.MEMORY	Counter Memory
C.PAUSE	Camera Pause
C.RESET	Counter Reset
C.REVERSE	Count Reverse
C.SYNC	Composite Synchronizing Signal
C/R	Capacitor/Resistor
CATV	Cable TV
CAPST.	Capstan
CCD	Charge Coupled Device
CH	Channel
CNR	Chroma Noise Reducer
CHAR.	Character
COM.	Common
COMP-EXP	Compressor-Expander
COMPA	Comparator
COMPE	Compensator
COM.	Composite
CONV.	Converter
CORR.	Correlation
COUNT.	Counter
CST	Cassette
CTL	Control Track Pulse
CYL.	Cylinder
D	
D/A	Digital to Analog
D/W	Dark/White
DA	Double Azimuth
DEEMPH.	Deemphasis
DEMOD.	Demodulator
DET	Detector
DISCRI.	Discriminator
DISP.	Display
DL	Delay line
DN	Down
DO	Dropout
DOC	Dropout Compensator
E	
E-E	Electronic-to-Electronic
EA-ROM	Electrically Alterable Read Only Memory
EMPH	Emphasis
EQ	Equalizer
EXT.	External
F	
FF	Flip Flop
F.FWD	Fast Forward
FG	Frequency Generator
FM	Frequency Modulation
FRAME ADV./F.ADV	Frame Advance
fsc	Color Sub Carrier Frequency
FWD	Forward
G	
GEN	Generator
GND	Ground
H	
HD	Horizontal Drive
Hi-Fi	High Fidelity
HPF	High-pass Filter
HPL	High-pass Limiter
HSS	Horizontal Sync. Separator
I	
I/O	In/Out (Input/Output)
IF	Intermediate Frequency
INDI.	Indicator
INT.	Internal
INV.	Inverter
IR	Infrared Rays
IRT	Instant Recording Timer
L	
LCD	Liquid Crystal Display
LIN.	Linear
LNC	Line Noise Canceller
LM	Loading Motor
LOG.	Logarithm
LPF	Low-pass Filter
L/R	Left/Right
LP	Long play
M	
M.CUT	Monitor Cut
M.STATE	Mechanism State
M.STOP	Memory Stop
MEM.	Memory
MIX	Mixer
MM	Monostable Multivibrator
MOD.	Modulator
MPX	Multiplex
MTS	Multi Channel Television Sound
N	
NF	Negative Feed Back
NORM.or NOR.	Normal
NR	Noise Reduction

O	
OSC	Oscillator
OSD	On-Screen Display
P	
PB/PLAY	Playback
PIF	Picture Intermediate Frequency
PLL	Phase Locked Loop
POS.	Positive
POWER CONT.	Power Control
PROG.	Program
PROTECT.	Protector
PWM	Pulse Width Modulation
R	
REC	Record
RECT.	Rectifier
REF	Reference
REG	Regulator
REV	Reverse
REW	Rewind
RF	Radio Frequency
RAM	Randum Access Memorey
ROM	Read Only Memory
S	
S/H	Sample and Hold
S.REEL	Supply Reel Sensor
S.TRACK.	Slow Tracking
S-VHS	Super VHS
SAW	Sawtooth
SAP	Second Audio Program
SEP.	Separator
SIF	Sound Intermediate Frequency
SP	Standard Play
SRCH	Search
SRV	Servo
SW 25Hz	Head Switching Pulse
SYNC	Synchronizing Signal
SYS.CON	System Control
T	
T/L	Tuner/Line
T.BRAKE	Take-up Brake
Tμp	Timer Microprocessor
T.REEL	Take-up Reel Sensor
T.RESET	Timer Reset
TP	Test Point
TRS	Transfer
TU-μP	Tuning Microprocessor
U	
U/D	Up/Down
UNI.	Unified
V	
V-REF	Voltage Reference
V.DRV	Vertical Drive Pulse
V.DUB	Video Dub
VAR.	Variable
VCA	Voltage Controlled Amplitier
VCO	Voltage Controlled Oscillator
VHS	Video Home Systems

Vss	Voltage Super Source
VOL.	Volume
VSS	Vertical Sync. Separator
VT	Tuning Voltage
VT-U	Tuning Voltage-UHF
VT-V	Tuning Voltage-VHF
W	
WE	Weighting
Y	
Y/C	Luminance/Chrominance

DIGITAL PROCESS CIRCUIT

A	
ADC B-Y	Analog to Digital Converted B-Y Signal
ADC R-Y	Analog to Digital Converted R-Y Signal
ADC Y	Analog to Digital Converted Luminance
ADRS	Address
C	
CAS	Column Address Strobe
C.BLANK	Chroma Blanking
D	
DRAM	Dynamic Random Access Memory
DEMPX	Demultiplexer
DWC	Delayed Write Clock
DT/OE	Date Transfer /Output Enable
D.REF 25	Delayed Reference 25Hz
D.SW 25	Delayed Switching 25Hz
I	
INC	Row Counter Increment
M	
MEM	Memory
MEM VIDEO	Memorized Video
MEM SW	Memory Switch
MEM ON	Memory ON
MPX	Multiplexer
MPX VIDEO	Multiplexed Video
O	
O/E	Odd/Even Field
P	
P IN P	Picture in Picture
PIX MOVE	Picture Move
R	
RC	Reading Clock
RCC	Reading Clock Clear
RCR	Row Counter Reset
RAS	Row Address Strobe
REF 25	Reference 25Hz from servo circuit
REL	Refresh Control
S	
SC	Serial Control
W	
WC	Write Clock
WCC	Write Clock Clear
WRITE ENBL (WE)	Write Enable

SEMICONDUCTOR CONFIGURATION

When replacing a semiconductor, take care of its pin numbers and makings (recess, paint) so as not to insert it in reverse.

TRANSISTOR

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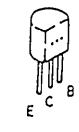	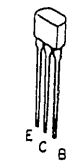	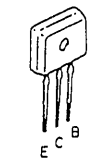	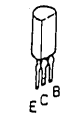	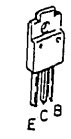
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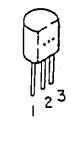	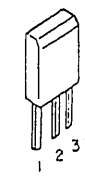	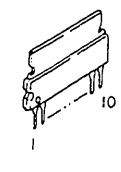	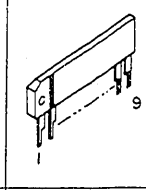		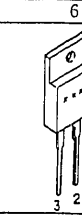
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IC (DUAL INLINE PACKAGE)

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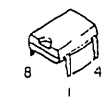	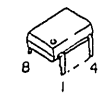	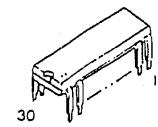	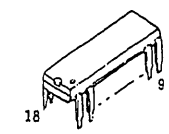
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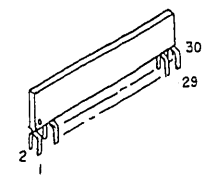	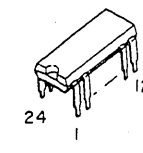	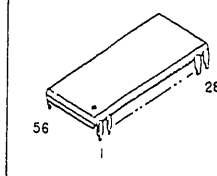	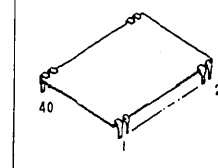
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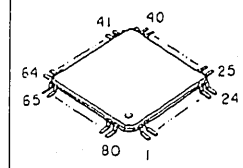			
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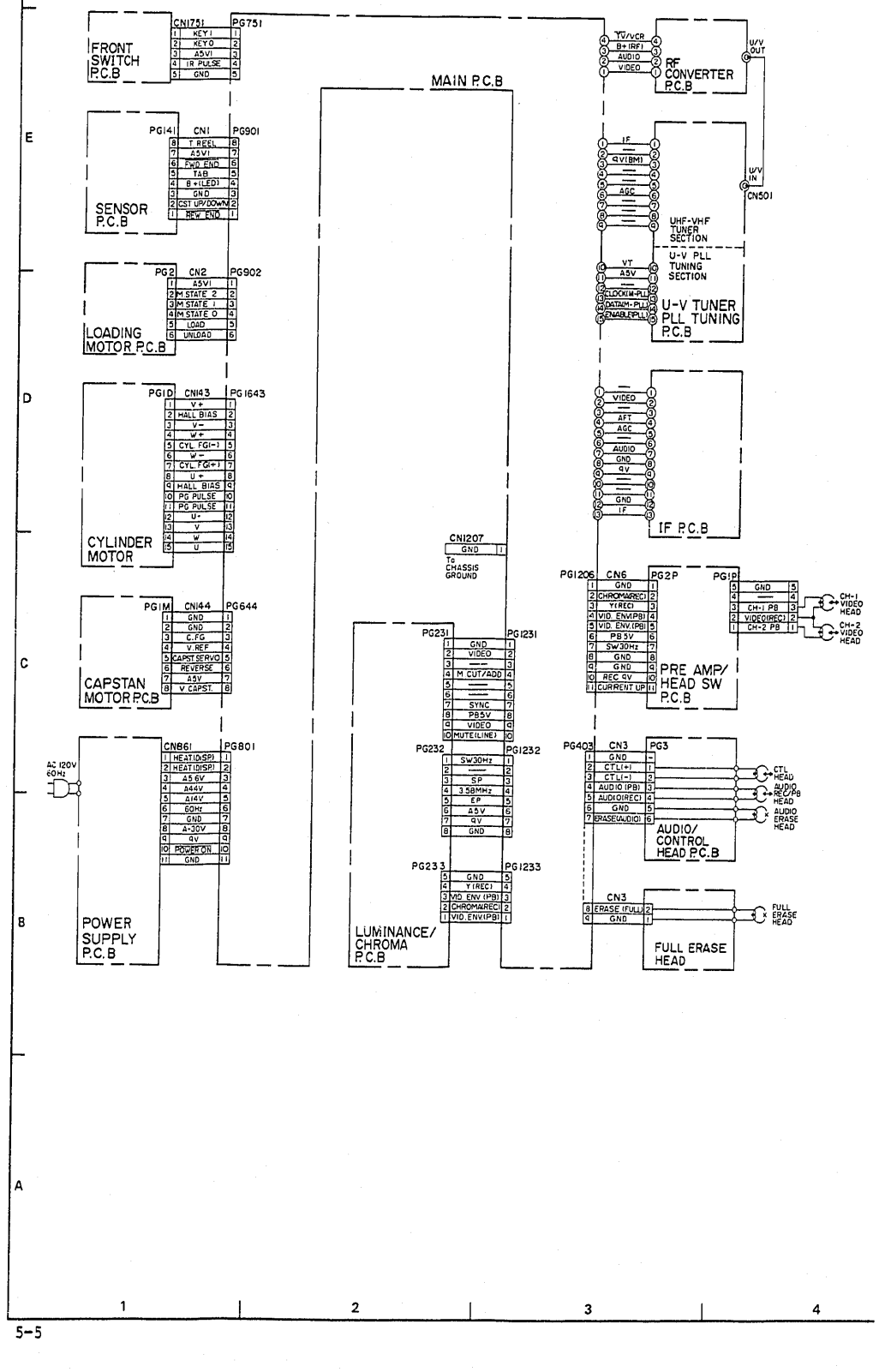
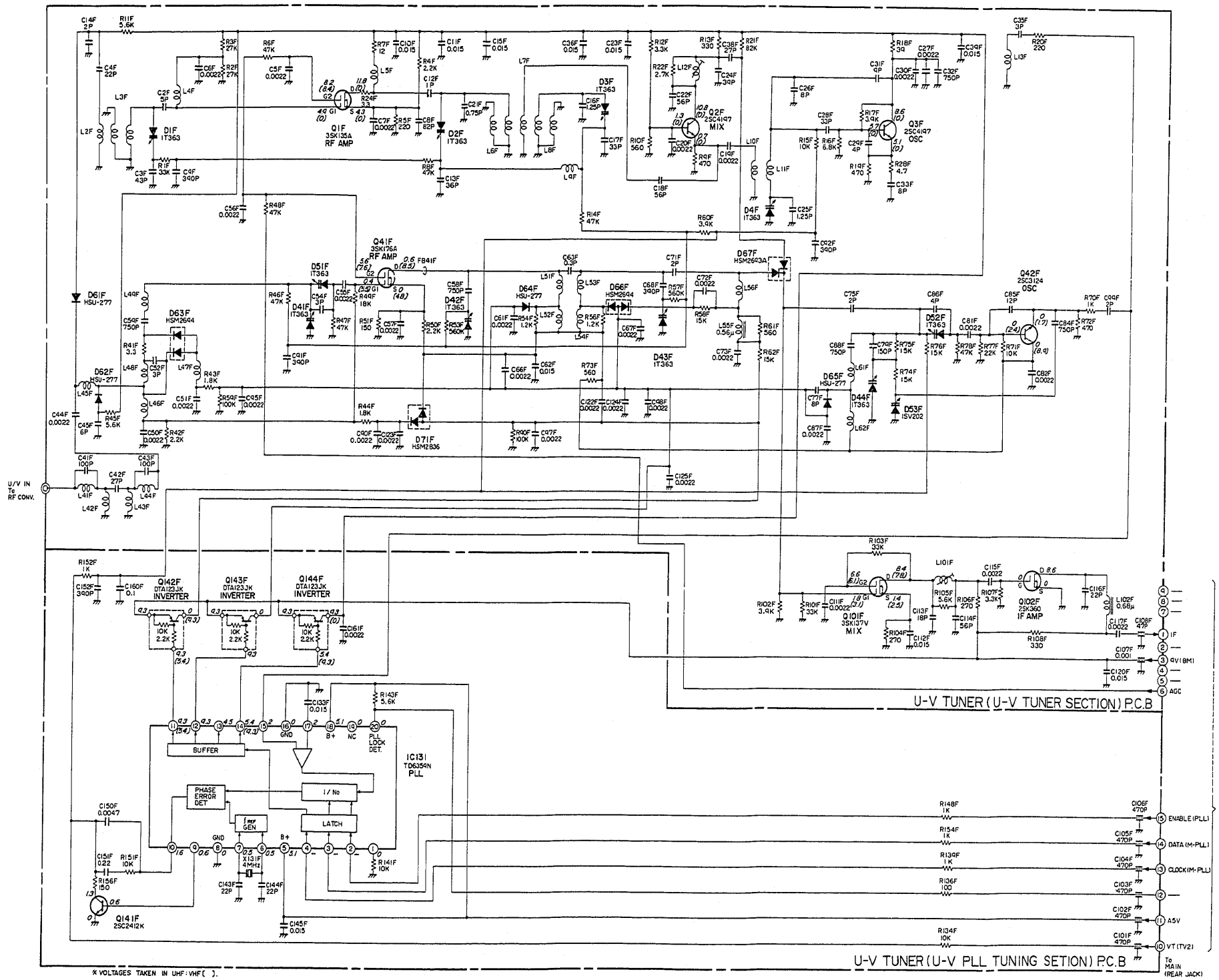
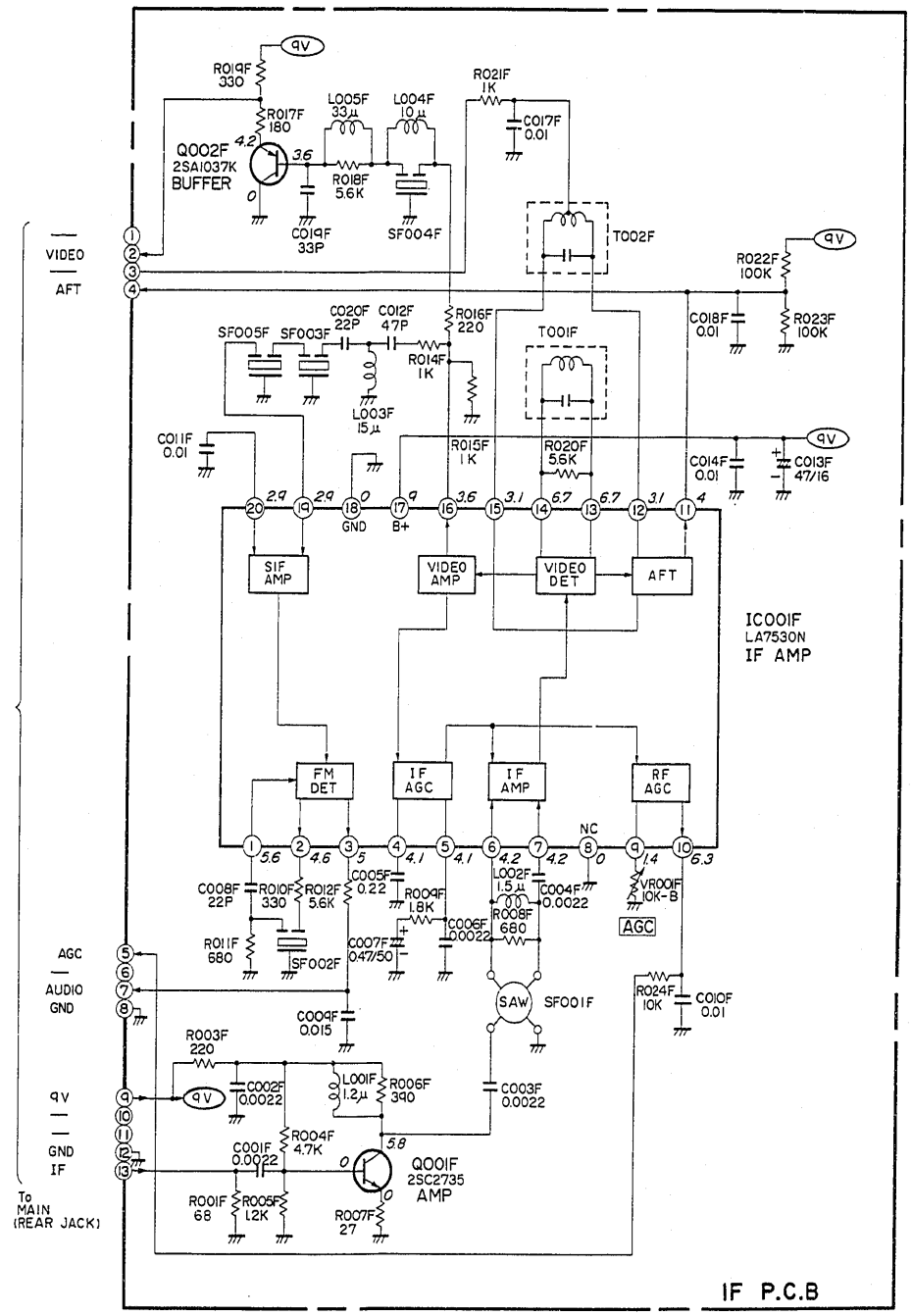
INTERNAL WIRING DIAGRAM



U-V TUNER SCHEMATIC DIAGRAM

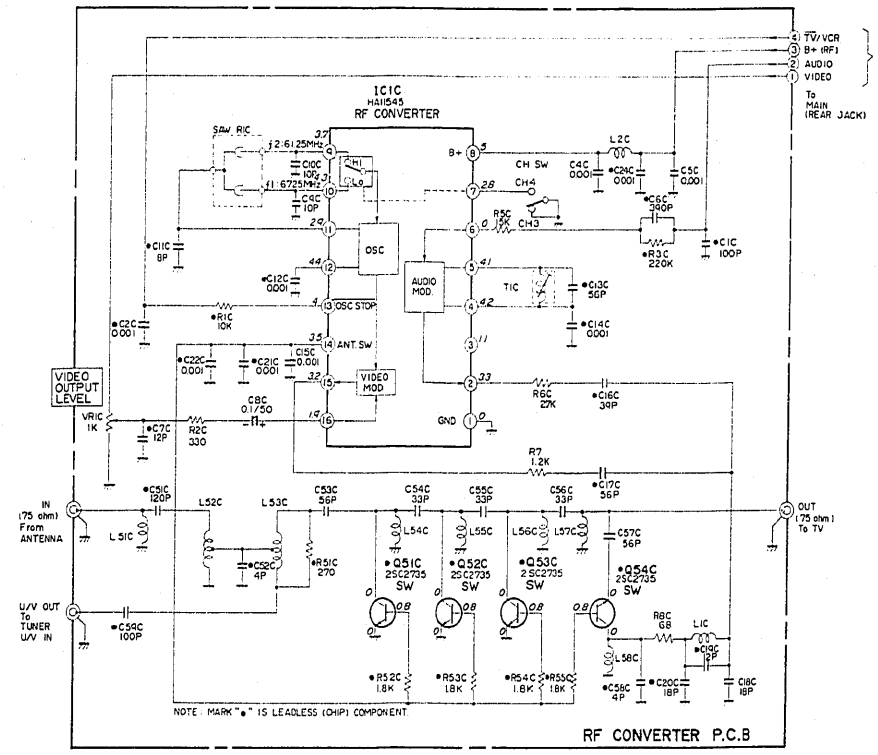


IF SCHEMATIC DIAGRAM

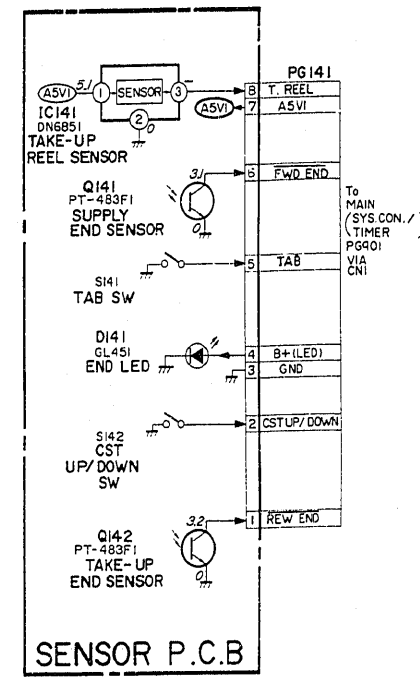


IF P.C.B

RF CONVERTER SCHEMATIC DIAGRAM



SENSOR SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM	PAGE
U-V TUNER	5-6
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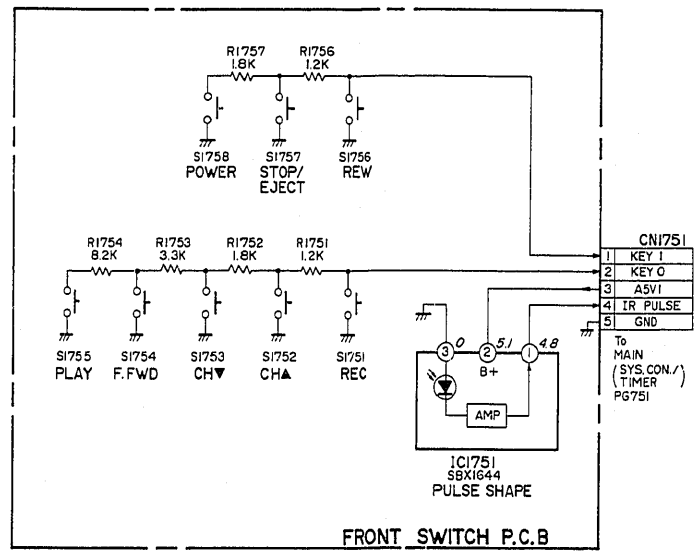
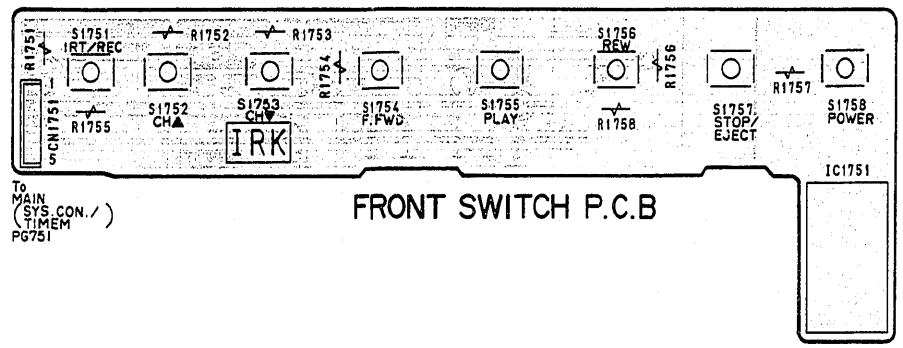
RF CONVERTER	5-9
SENSOR	5-9
FRONT SWITCH	5-10
PRE/REC AMP	5-11
SYS.CON./TIMER	5-12
AUDIO	5-14
CLY.MOTOR DRIVE	5-15
CAPSTAN MOTOR	5-15
REAR JACK	5-18
LUMINANCE/CHROMA	5-22
POWER SUPPLY	5-26
14V REGULATOR	5-26

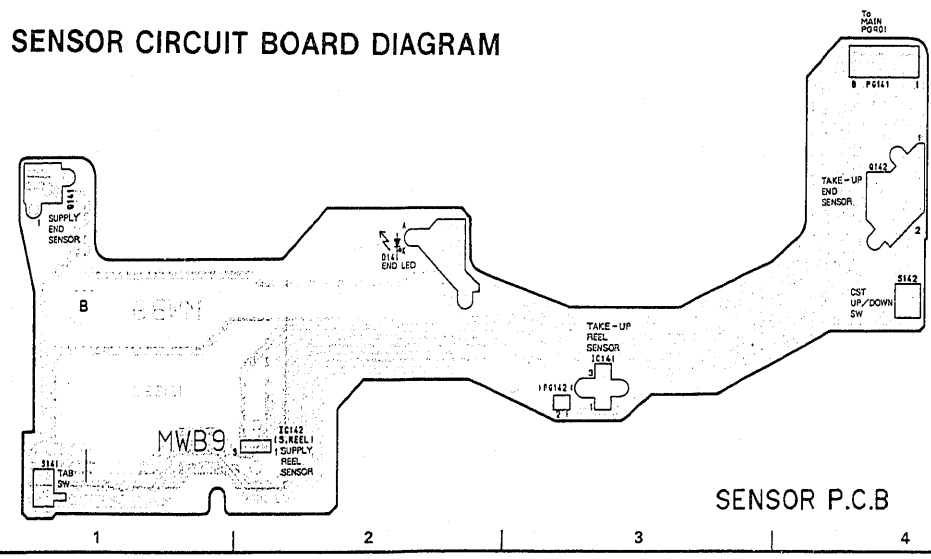
FRONT SWITCH SCHEMATIC DIAGRAM



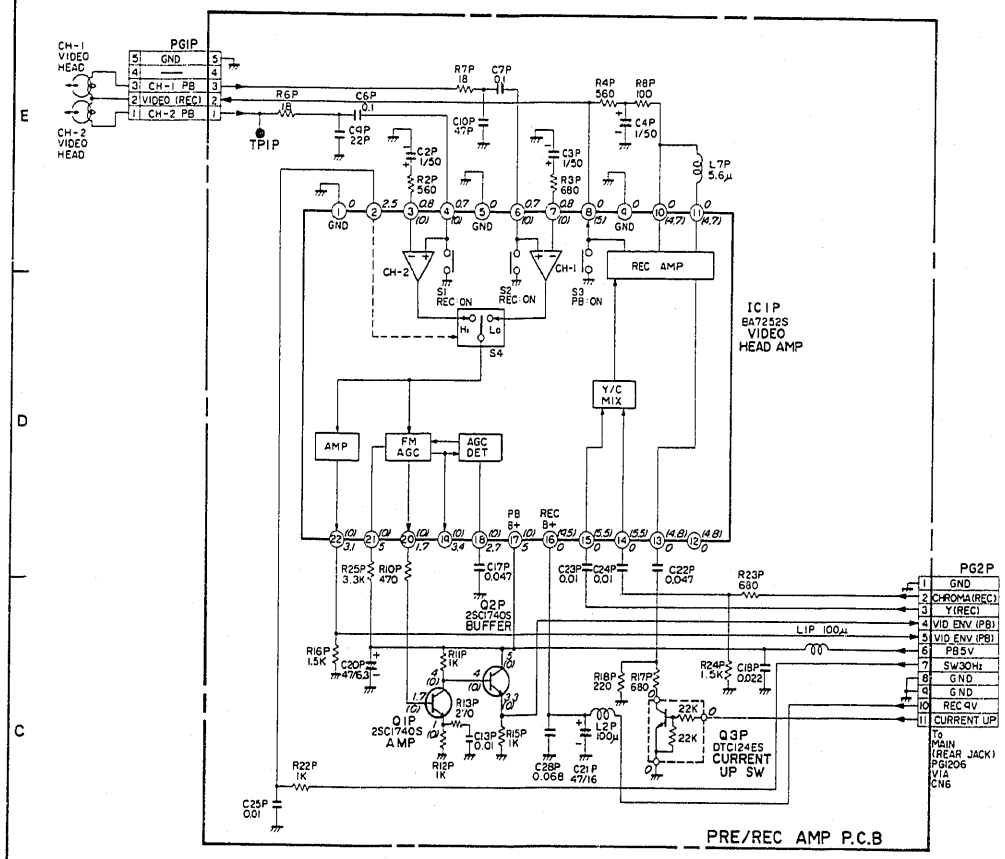
FRONT SWITCH CIRCUIT BOARD DIAGRAM



SENSOR CIRCUIT BOARD DIAGRAM



PRE/REC AMP SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM	PAGE
U-V TUNER	5-6
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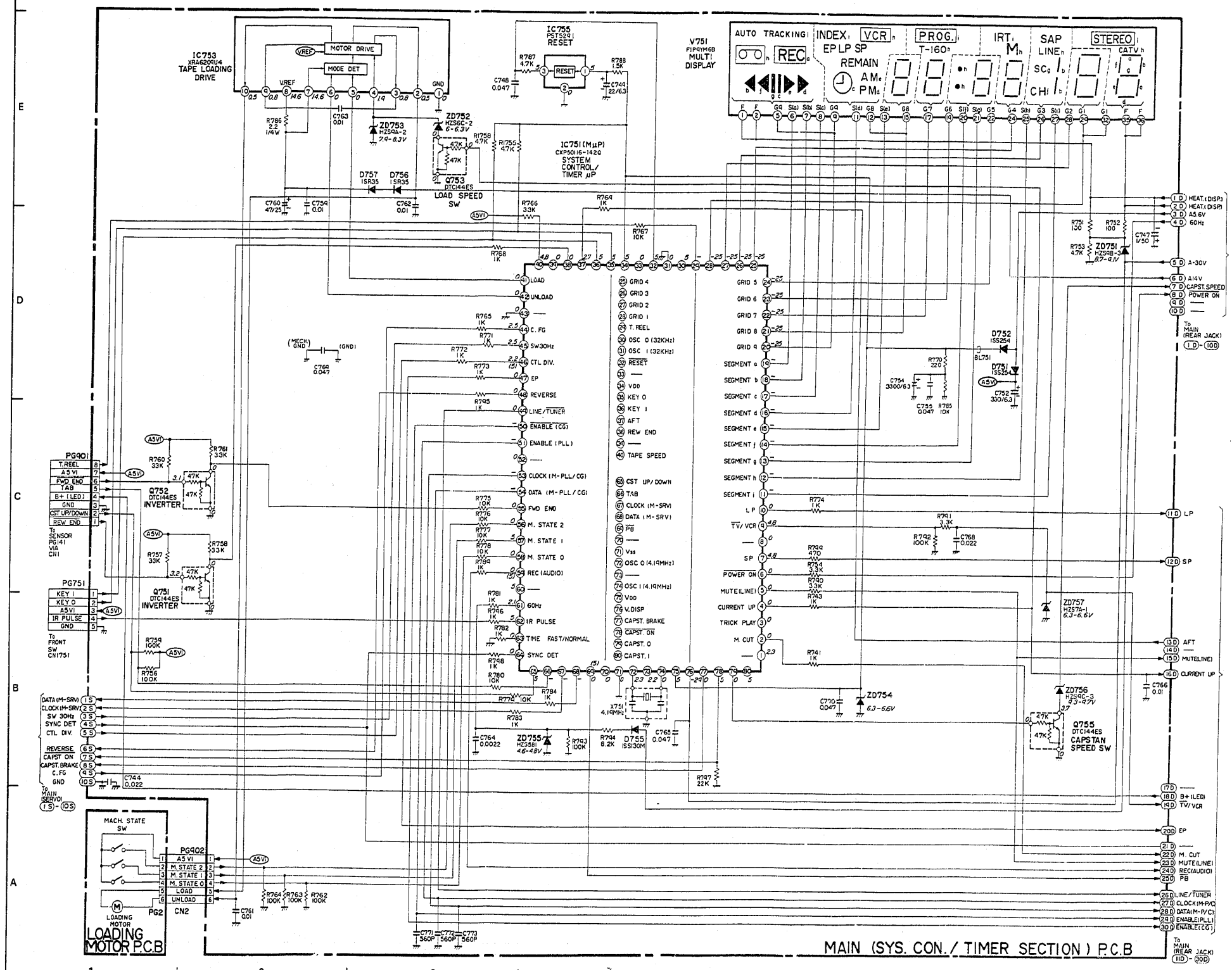
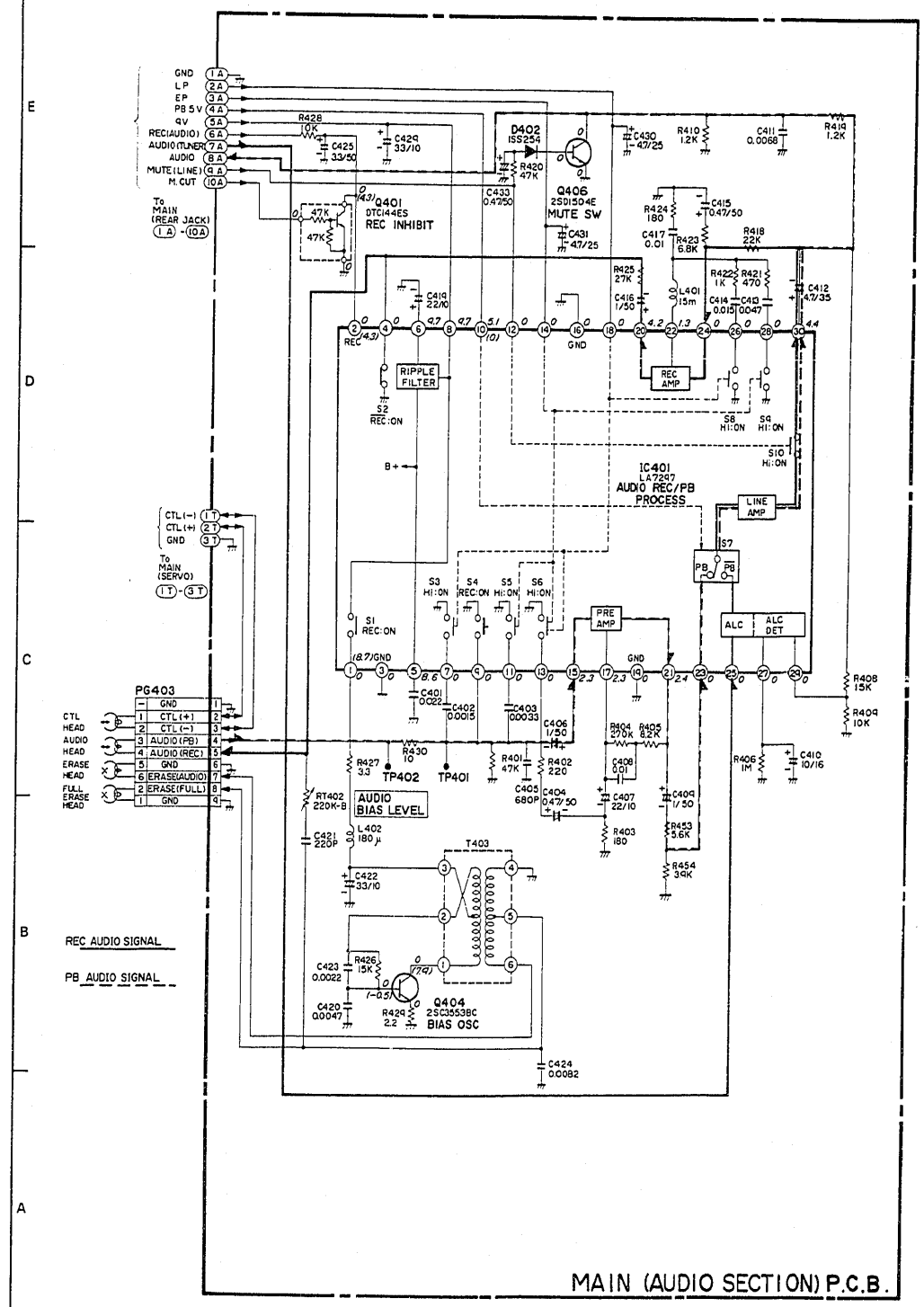
AUDIO	5-14
CLY.MOTOR DRIVE	5-15
CAPSTAN MOTOR	5-15
REAR JACK	5-18
LUMINANCE/CHROMA	5-22
POWER SUPPLY	5-26
14V REGULATOR	5-26

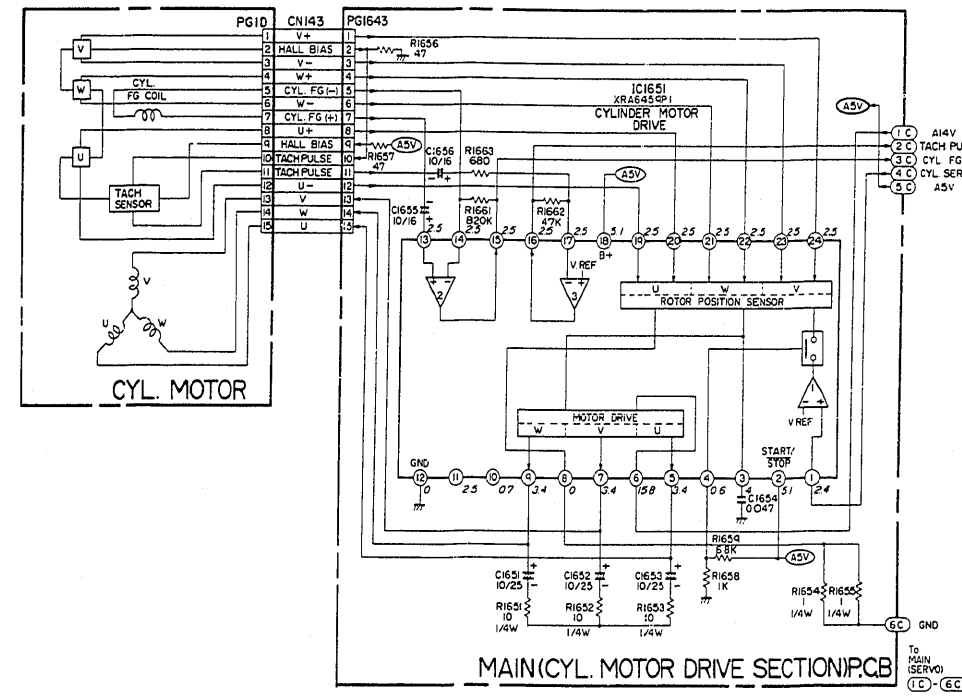
SYS. CON./TIMER SCHEMATIC DIAGRAM



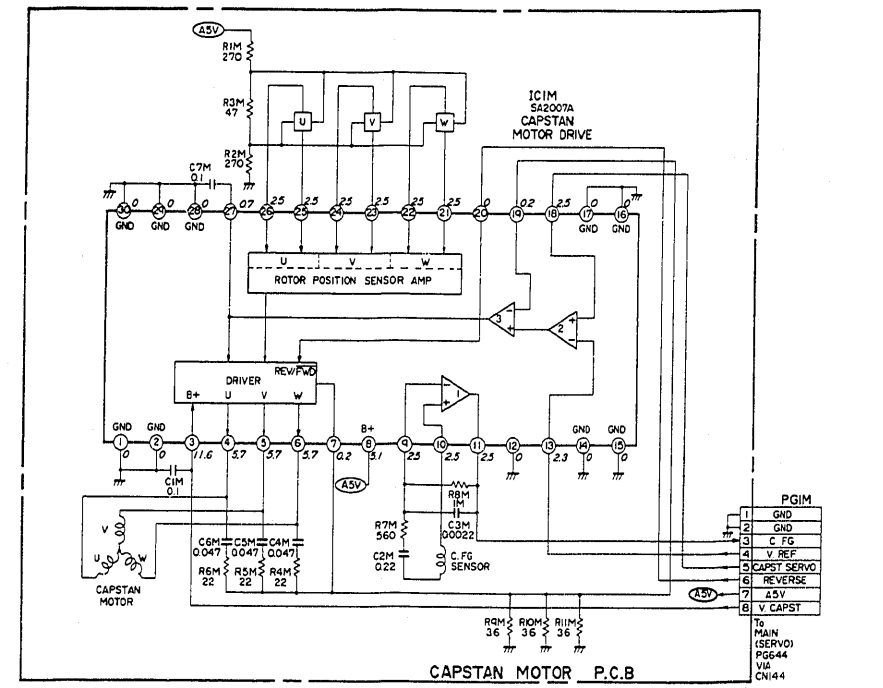
AUDIO SCHEMATIC DIAGRAM



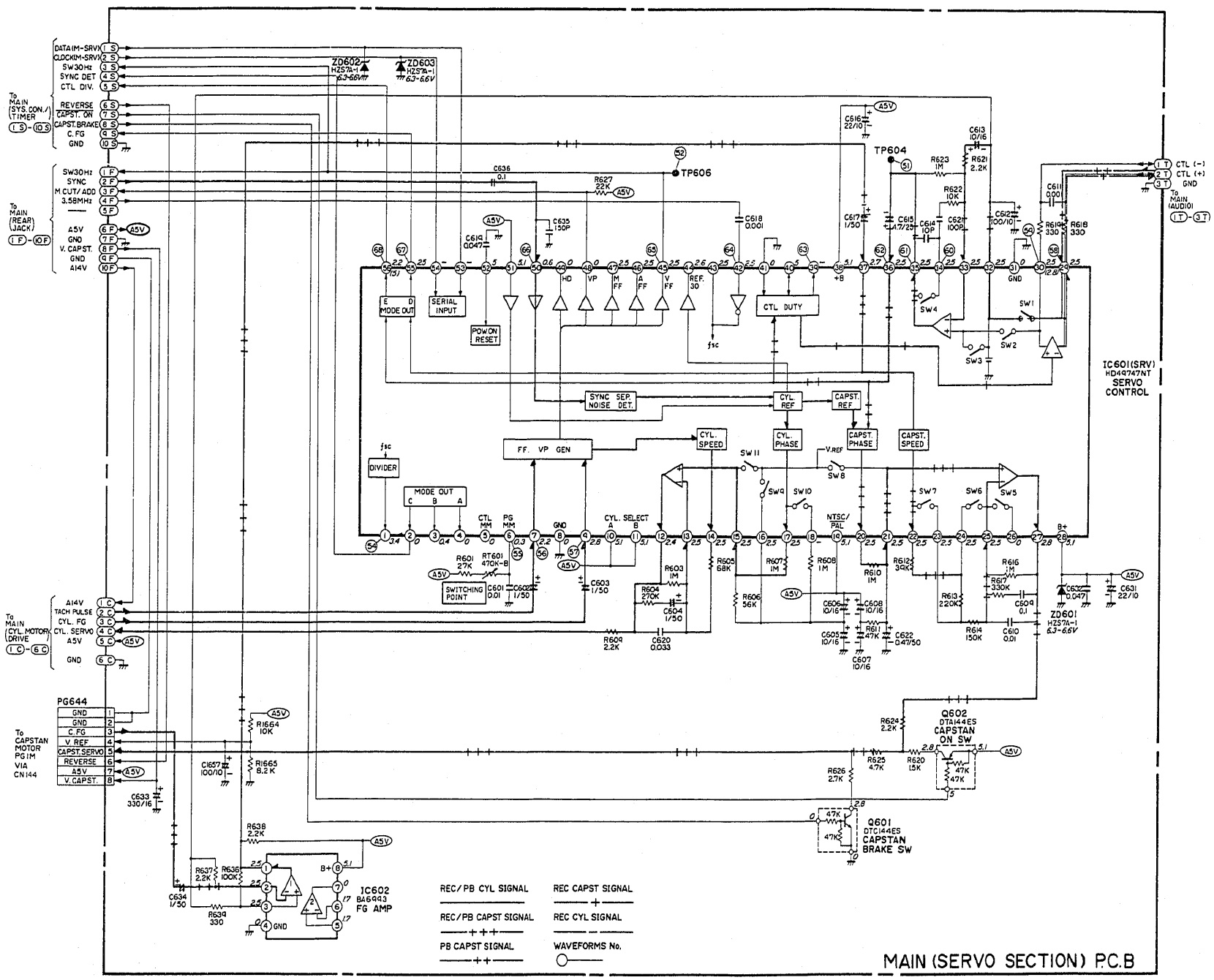
CYL. MOTOR DRIVE SCHEMATIC DIAGRAM

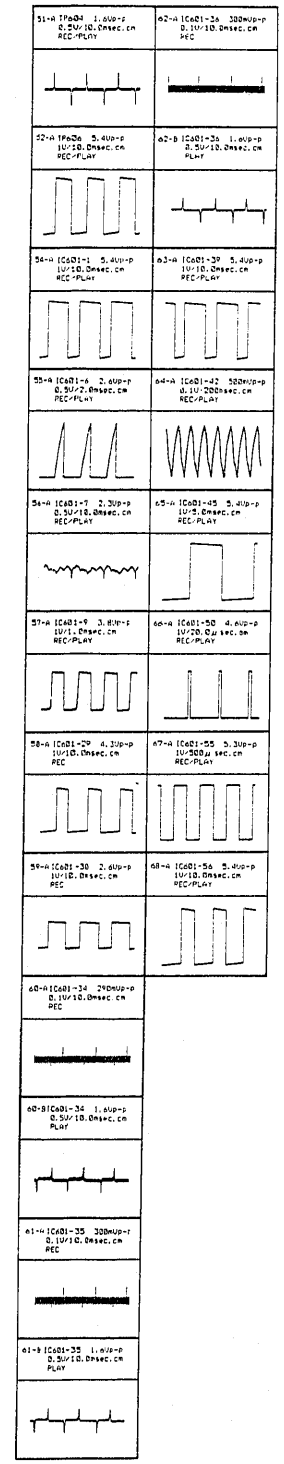


CAPSTAN MOTOR SCHEMATIC DIAGRAM



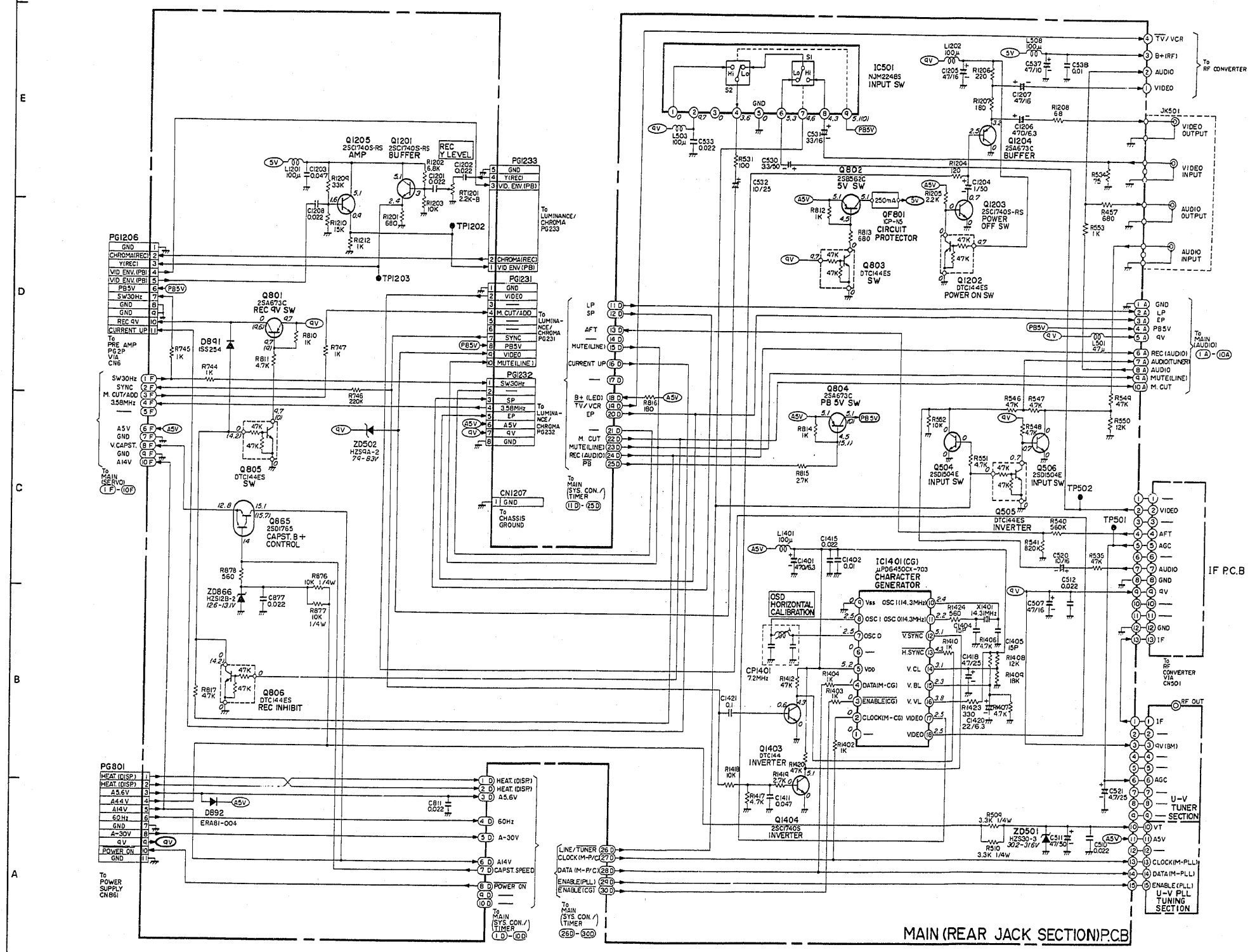
SERVO SCHEMATIC DIAGRAM





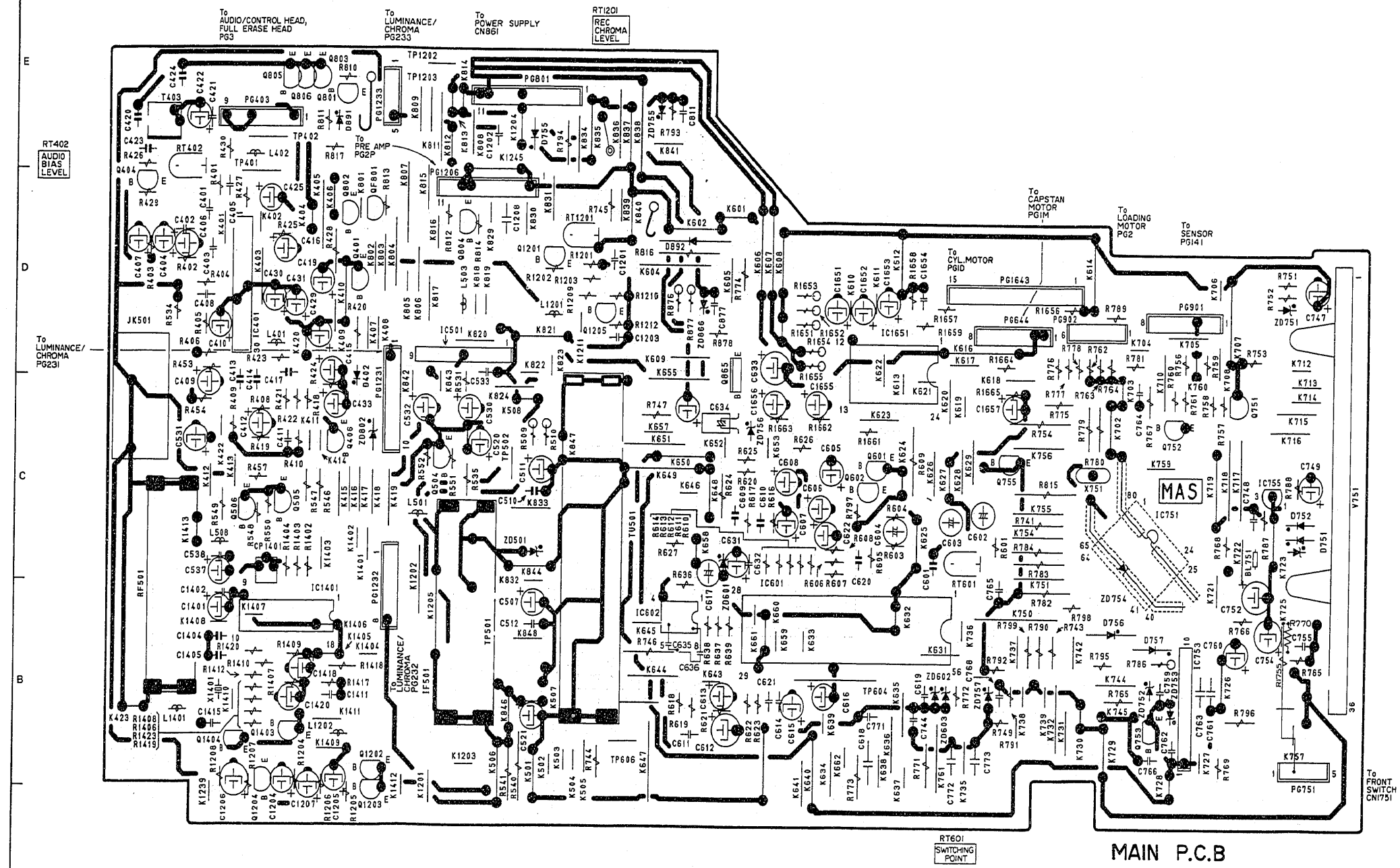
SERVO 5-16 5-17 SERVO

REAR JACK SCHEMATIC DIAGRAM

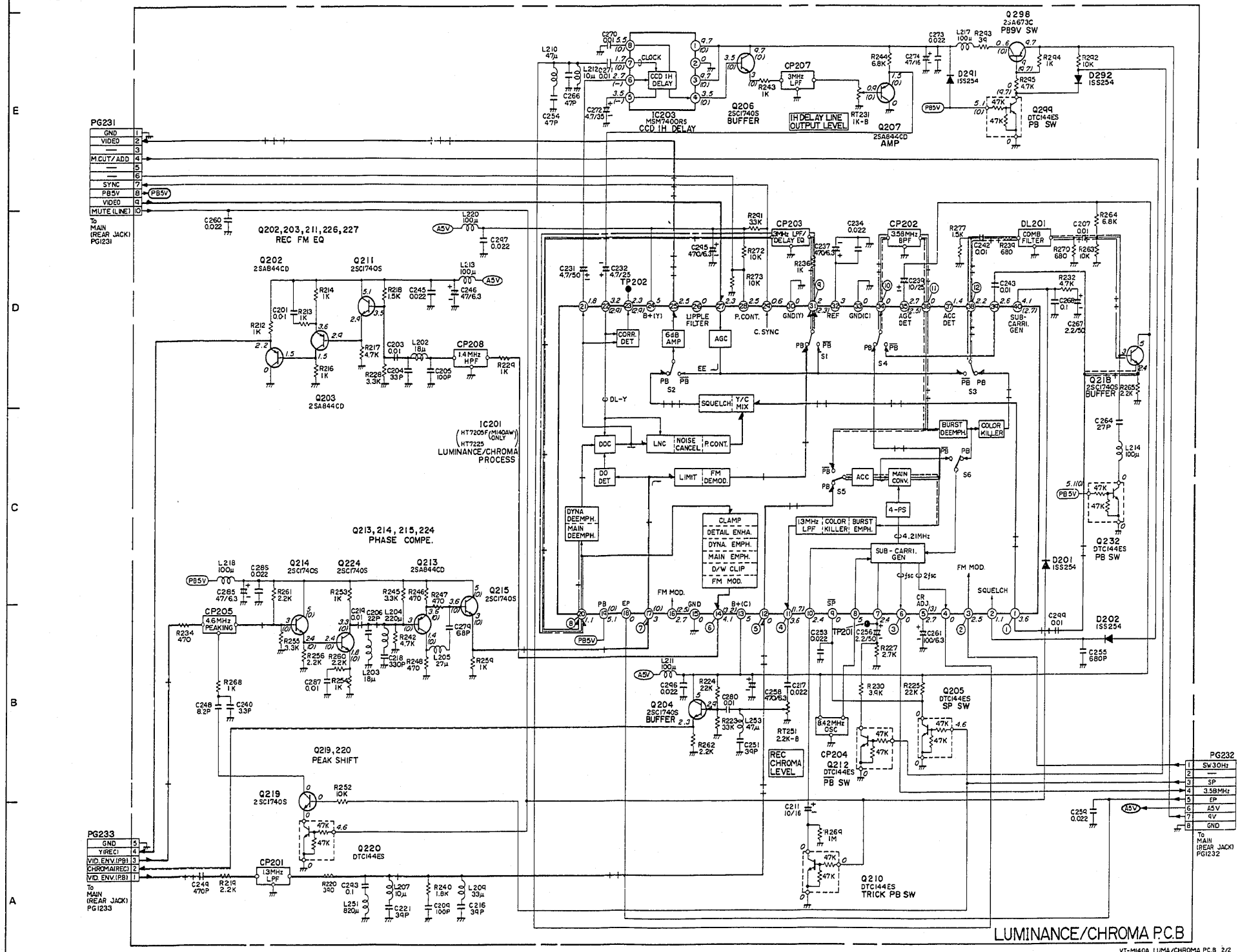


REAR JACK 5-18 5-19 REAR JACK

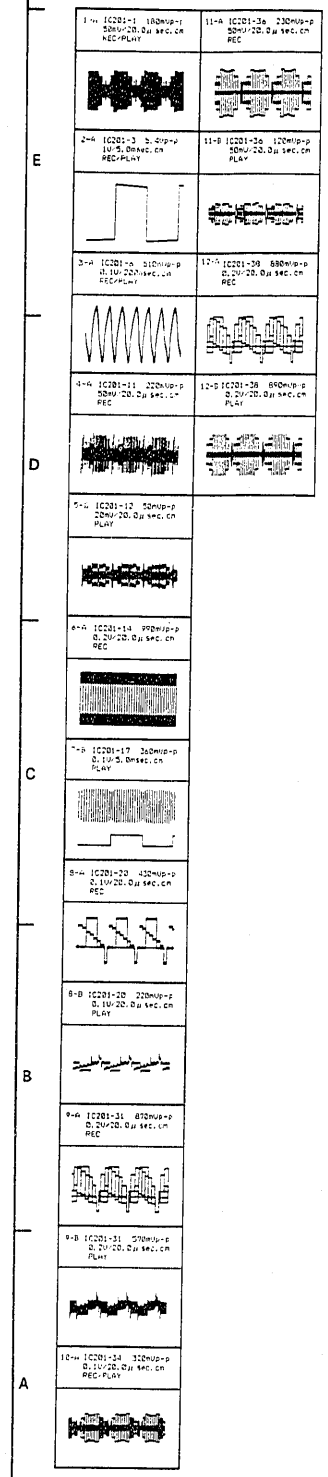
MAIN CIRCUIT BOARD DIAGRAM

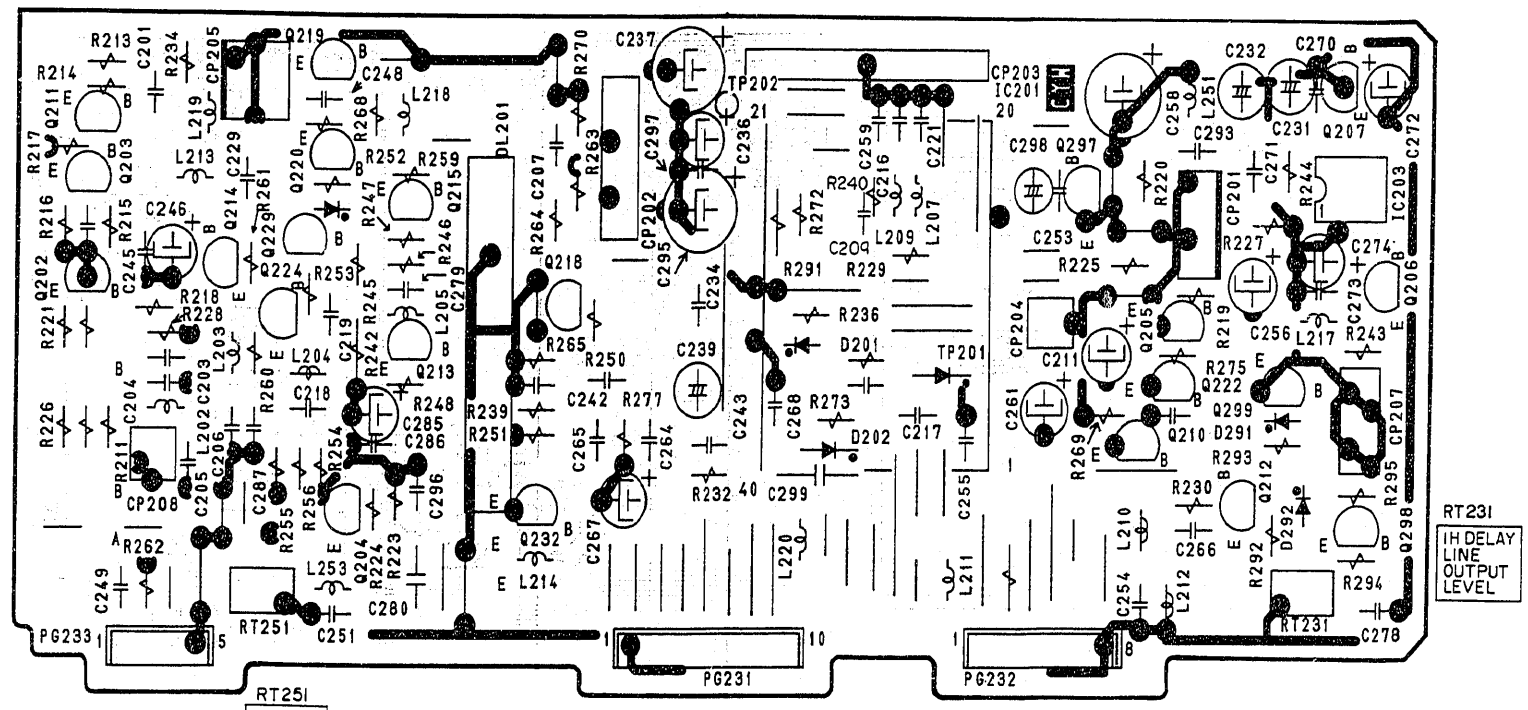


LUMINANCE/CHROMA SCHEMATIC DIAGRAM



LUMINANCE/CHROMA CIRCUIT BOARD DIAGRAM





LUMINANCE / CHROMA P.C.B

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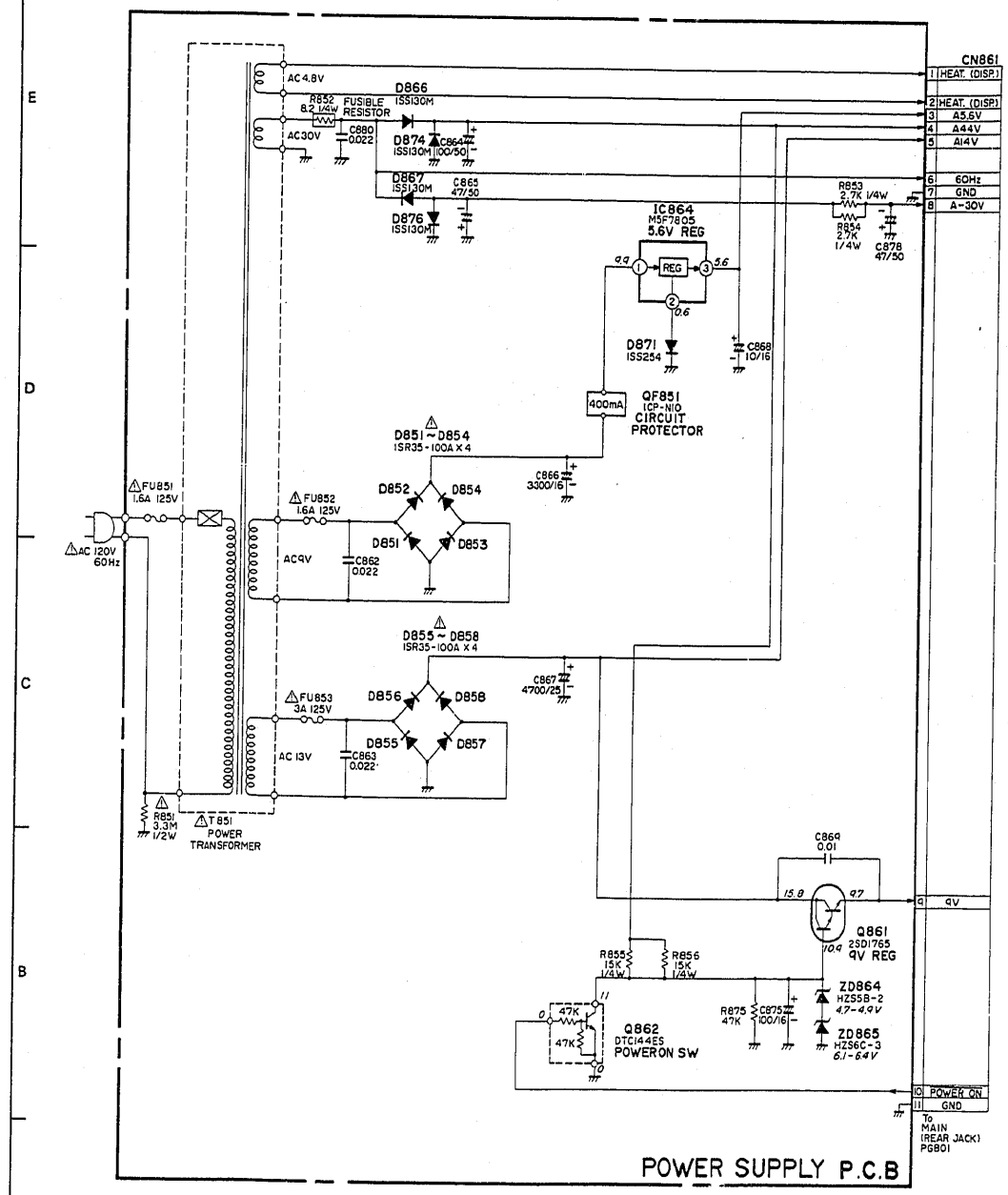
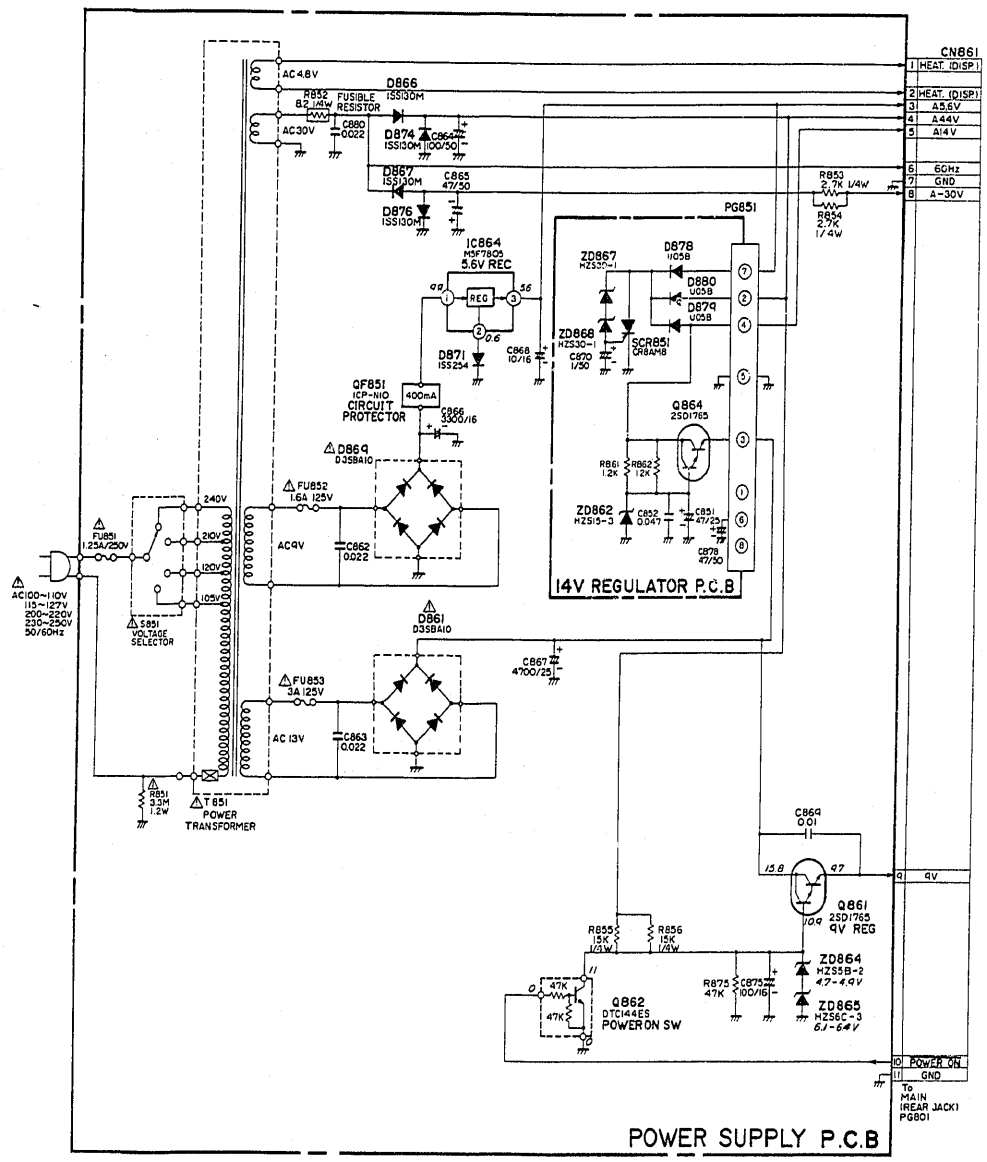
14V REGULATOR	5-26

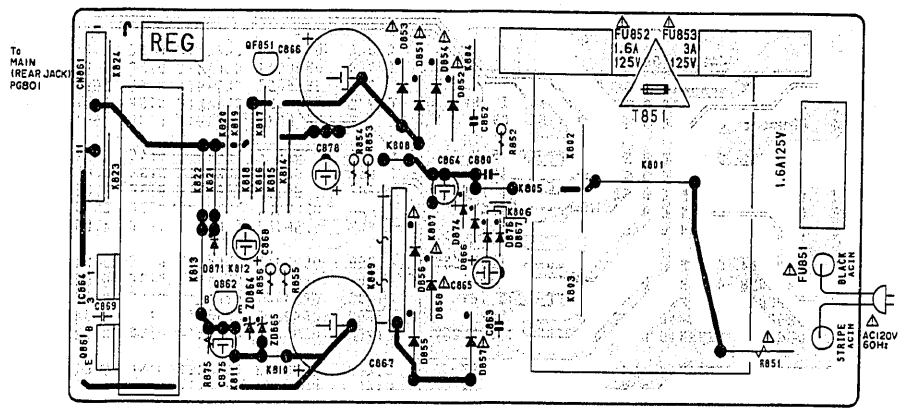
POWER SUPPLY SCHEMATIC DIAGRAM (VT-M140A/M141A/M131A)



POWER SUPPLY SCHEMATIC DIAGRAM (VT-M140AW)

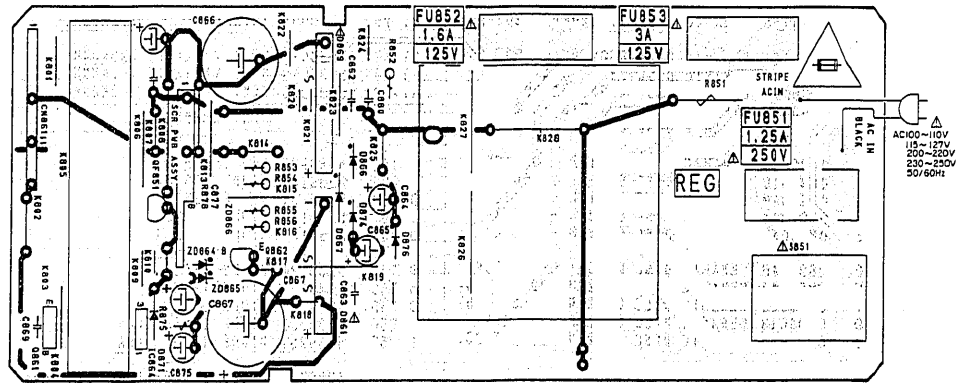


POWER SUPPLY CIRCUIT BOARD DIAGRAM (VT-M140A/M141A/M131A)



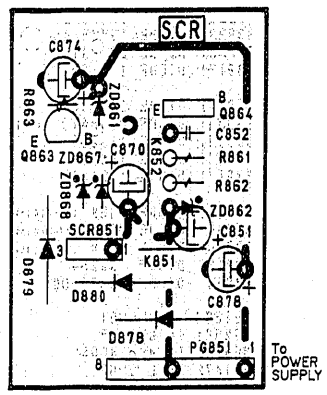
POWER SUPPLY P.C.B

POWER SUPPLY CIRCUIT BOARD DIAGRAM (VT-M140AW)



POWER SUPPLY P.C.B

14V REGULATOR CIRCUIT BOARD DIAGRAMS



14V REGULATOR P.C.B

SCHEMATIC DIAGRAM	PAGE
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CAPSTAN MOTOR	5-15
REAR JACK	5-18
LUMINANCE/CHROMA	5-22
POWER SUPPLY	5-26
14V REGULATOR	5-26

REPLACEMENT PARTS LIST
ELECTRICAL PARTS LIST

SYMBOL-No	P-No	DESCRIPTION
		CAPACITORS
C 201	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 203	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 204	0890015	CERAMIC DISC 33PF+-5% 50V
C 205	0890022	CERAMIC DISC 100PF+-10% 50V
C 206	0890013	CERAMIC DISC 22PF+-5% 50V
C 207	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 209	0890022	CERAMIC DISC 100PF+-10% 50V
C 216	0890016	CERAMIC DISC 39PF+-50% 50V
C 217	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 218	0890028	CERAMIC DISC 330PF+-10% 50V
C 219	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 221	0890016	CERAMIC DISC 39PF+-50% 50V
C 234	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 242	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 243	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 244	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 248	0890007	CERAMIC DISC 8.2PF+-10% 50V
C 249	0890031	CERAMIC DISC 470PF+-10% 50V
C 251	0890016	CERAMIC DISC 39PF+-50% 50V
C 253	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 254	0890017	CERAMIC DISC 47PF+-5% 50V
C 255	0890033	CERAMIC DISC 680PF+-10% 50V
C 259	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 260	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 264	0890014	CERAMIC DISC 27PF+-50% 50V
C 266	0890017	CERAMIC DISC 47PF+-5% 50V
C 268	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 270	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 271	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 279	0890019	CERAMIC DISC 68PF+-50% 50V
C 280	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 286	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 287	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 293	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 296	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 297	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 299	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 401	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 402	0890036	CERAMIC DISC 1500PF+-20% 16V
C 403	0890038	CERAMIC DISC 3300PF+-20% 16V
C 405	0890033	CERAMIC DISC 680PF+-10% 50V
C 408	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 411	0890041	CERAMIC DISC 6800PF+-20% 16V
C 421	0890026	CERAMIC DISC 220PF+-10% 50V
C 424	0204271	POLYESTER FILM 8200PF+-5% 100V
C 512	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 533	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 538	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 611	0890035	CERAMIC DISC 1000PF 50V
C 614	0890008	CERAMIC DISC 10PF+-5% 50V
C 618	0890035	CERAMIC DISC 1000PF 50V
C 619	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C 621	0890022	CERAMIC DISC 100PF+-10% 50V
C 632	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C 744	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 748	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C 755	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C 759	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 761	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 762	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 763	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 764	0890037	CERAMIC DISC 2200PF+-20% 16V
C 765	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C 766	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 768	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 771	0890032	CERAMIC DISE 560PF+-10% 50V
C 772	0890032	CERAMIC DISE 560PF+-10% 50V
C 773	0890032	CERAMIC DISE 560PF+-10% 50V
C 811	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 862	0890102	CERAMIC DISC 0.022UF+80-20% 50V
C 863	0890102	CERAMIC DISC 0.022UF+80-20% 50V
C 866	0256864	ELECTROLYTIC 3300UF 16V
C 867	0256787	ELECTROLYTIC 4700UF 25V
C 869	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1201	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C1202	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C1203	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C1208	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C1402	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1404	0208444	CERAMIC DISC 15PF+-5% 50V
C1405	0208444	CERAMIC DISC 15PF+-5% 50V
C1411	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C1415	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C1654	0890045	CERAMIC DISC 0.047UF+80-20% 50V
		RESISTORS
RT 231	5030084	TRIMMER 1KOHM
RT 251	5030085	TRIMMER 2.2KOHM
RT 402	5030012	SEMI VARIABLE 220KOHM
RT 601	5030013	SEMI VARIABLE 470KOHM
RT1201	5030005	SEMI VARIABLE 2.2KOHM
		SEMI-CONDUCTORS
D 141	5380933	LED GL-451
D 201	5339131	DIODE 1SS254
D 202	5339131	DIODE 1SS254
D 291	5339131	DIODE 1SS254
D 402	5339131	DIODE 1SS254
D 751	5339131	DIODE 1SS254
D 752	5339131	DIODE 1SS254
D 755	5339171	DIODE 1SS130
D 756	5339231	DIODE 1SR35-100A
D 757	5339231	DIODE 1SR35-100A
△D 851	5339231	DIODE 1SR35-100A (VT-M140A/M141A/M131A)
△D 852	5339231	DIODE 1SR35-100A (VT-M140A/M141A/M131A)
△D 853	5339231	DIODE 1SR35-100A (VT-M140A/M141A/M131A)
△D 854	5339231	DIODE 1SR35-100A (VT-M140A/M141A/M131A)
△D 855	5339231	DIODE 1SR35-100A (VT-M140A/M141A/M131A)
△D 856	5339231	DIODE 1SR35-100A (VT-M140A/M141A/M131A)
△D 857	5339231	DIODE 1SR35-100A (VT-M140A/M141A/M131A)
△D 858	5339231	DIODE 1SR35-100A (VT-M140A/M141A/M131A)
△D 861	5333351	DIODE D3SBA10 (VT-M140AW)
D 866	5339171	DIODE 1SS130
D 867	5339171	DIODE 1SS130
△D 869	5333351	DIODE D3SBA10 (VT-M140AW)
D 871	5339131	DIODE 1SS254
D 874	5339171	DIODE 1SS130
D 876	5339171	DIODE 1SS130
D 878	5330561	DIODE U05B (VT-M140AW)
D 879	5330501	DIODE U05B (VT-M140AW)
D 880	5330501	DIODE U05B (VT-M140AW)
D 891	5339131	DIODE 1SS254
D 892	5332541	DIODE ERA81-004
IC 141	5391282	IC DN6851
IC 201	1372531	IC HT7225
IC 203	1360231	IC MSM7400RS
IC 401	1341472	IC LA7297
IC 501	1342031	IC NJM2248S

SYMBOL-No	P-No	DESCRIPTION
IC 601	1360391	IC HD49747NT
IC 602	5367221	IC BA6993
IC 751	1355153	IC CXP50116-142Q
IC 753	5300795	IC XRA6209U4
IC 755	1341193	IC PST529I
IC 864	1341511	IC M5F7805L
IC1401	1361443	IC UPD6450CX-703
IC1651	1360072	IC XRA6459P1
IC1751	1388711	PWB ASSY SBX1644
Q 141	5324661	TRANSISTOR PT-483F1
Q 142	5324661	TRANSISTOR PT-483F1
Q 202	5327021	TRANSISTOR 2SA844CD
Q 203	5327021	TRANSISTOR 2SA844CD
Q 204	5327063	TRANSISTOR 2SC1740S
Q 205	5327073	TRANSISTOR DTC144ES
Q 206	5327063	TRANSISTOR 2SC1740S
Q 207	5327021	TRANSISTOR 2SA844CD
Q 210	5327073	TRANSISTOR DTC144ES
Q 211	5327063	TRANSISTOR 2SC1740S
Q 212	5327073	TRANSISTOR DTC144ES
Q 213	5327021	TRANSISTOR 2SA844CD
Q 214	5327063	TRANSISTOR 2SC1740S
Q 215	5327063	TRANSISTOR 2SC1740S
Q 218	5327063	TRANSISTOR 2SC1740S
Q 219	5327063	TRANSISTOR 2SC1740S
Q 220	5327073	TRANSISTOR DTC144ES
Q 224	5327063	TRANSISTOR 2SC1740S
Q 232	5327073	TRANSISTOR DTC144ES
Q 298	5327031	TRANSISTOR 2SA673C
Q 299	5327073	TRANSISTOR DTC144ES
Q 401	5327073	TRANSISTOR DTC144ES
Q 404	5327101	TRANSISTOR 2SC3553BC
Q 406	5327091	TRANSISTOR 2SD1504E
Q 504	5327091	TRANSISTOR 2SD1504E
Q 505	5327073	TRANSISTOR DTC144ES
Q 506	5327091	TRANSISTOR 2SD1504E
Q 601	5327073	TRANSISTOR DTC144ES
Q 602	5327074	TRANSISTOR DTA144ES-T
Q 751	5327073	TRANSISTOR DTC144ES
Q 752	5327073	TRANSISTOR DTC144ES
Q 753	5327073	TRANSISTOR DTC144ES
Q 755	5327073	TRANSISTOR DTC144ES
Q 801	5327031	TRANSISTOR 2SA673C
Q 802	5327131	TRANSISTOR 2SB562C
Q 803	5327073	TRANSISTOR DTC144ES
Q 804	5327031	TRANSISTOR 2SA673C
Q 805	5327073	TRANSISTOR DTC144ES
Q 806	5327073	TRANSISTOR DTC144ES
Q 861	1321341	TRANSISTOR 2SD1765
Q 862	5327073	TRANSISTOR DTC144ES
Q 864	1321341	TRANSISTOR 2SD1765 (VT-M140AW)
Q 865	1321341	TRANSISTOR 2SD1765
Q1201	5327063	TRANSISTOR 2SC1740S
Q1202	5327073	TRANSISTOR DTC144ES
Q1203	5327063	TRANSISTOR 2SC1740S
Q1204	5327031	TRANSISTOR 2SA673C
Q1205	5327063	TRANSISTOR 2SC1740S
Q1403	5327073	TRANSISTOR DTC144ES
Q1404	5327063	TRANSISTOR 2SC1740S
QF 801	5721941	IC PROTECTOR
QF 851	5721943	IC PROTECTOR
ZD 501	5339288	ZENER DIODE HZS30-3
ZD 502	5339271	ZENER DIODE HZS9A2
ZD 862	5339274	ZENER DIODE HZS15-3 (VT-M140AW)
ZD 864	5339296	ZENER DIODE HZS5B2
ZD 865	5339284	ZENER DIODE HZS6-C3
ZD 866	5339293	ZENER DIODE HZS12B2
ZD 867	5339256	ZENER DIODE HZS30 (VT-M140AW)
ZD 868	5339256	ZENER DIODE HZS30 (VT-M140AW)
		TRANSFORMERS
T 403	5262545	OSCILLATOR.BIAS
△T 851	5214361	TRANSFORMER.POWER (VT-M140A/M141A/M131A)
△T 851	5214183	TRANSFORMER.POWER (VT-M140AW)
		COILS
L 202	5159144	CHOKE COIL 18UH
L 203	5159144	CHOKE COIL 18UH
L 204	5159158	CHOKE COIL 220UH
L 205	5159146	CHOKE COIL 27UH
L 207	5159141	CHOKE COIL 10UH
L 209	5159147	CHOKE COIL 33UH
L 210	5159149	CHOKE COIL 47UH
L 211	5159077	CHOKE COIL 100UH+-10%
L 212	5159141	CHOKE COIL 10UH
L 213	5159077	CHOKE COIL 100UH+-10%
L 214	5121184	COIL 100UH
L 217	5159077	CHOKE COIL 100UH+-10%
L 218	5159077	CHOKE COIL 100UH+-10%
L 220	5159077	CHOKE COIL 100UH+-10%
L 251	5159089	CHOKE COIL 820UH+-10%
L 253	5159149	CHOKE COIL 47UH
L 401	5159114	COIL 15MH
L 402	5159157	CHOKE COIL 180UH
L 501	5159073	CHOKE COIL 47UH+-10%
L 503	5159077	CHOKE COIL 100UH+-10%
L 508	5159154	CHOKE COIL 100UH
L1201	5159077	CHOKE COIL 100UH+-10%
L1202	5159077	CHOKE COIL 100UH+-10%
L1401	5159077	CHOKE COIL 100UH+-10%
		CRYSTALS
X 751	5778071	CRYSTAL
X1401	5778311	CRYSTAL
		MISCELLANEOUS
BL 751	5272373	LINE FILTER
CP 201	5164733	LOW PASS FILTER
CP 202	5165121	BAND PASS FILTER
CP 203	5164705	FILTER,LOW PASS
CP 204	5165092	TRAP FILTER
CP 205	5163591	BAND PASS FILTER
CP 207	5163634	LOW PASS FILTER
CP 208	5162754	HIGHT PASS FILTER
CP1401	5163372	FILTER
DL 201	5786331	DELAY LINE
△FU 851	5721405	FUSE 1.6A (VT-M140A/M141A/M131A)
△FU 851	5721479	FUSE 1.25A (VT-M140AW)
△FU 852	5721405	FUSE 1.6A
△FU 853	5721408	FUSE 125V 3A
JK 501	5696031	PLATE,JACK
S 141	5635321	SWITCH
S 142	5635331	SWITCH
△S 851	5605341	SWITCH (VT-M140AW)
S1751	5635061	SWITCH
S1752	5635061	SWITCH
S1753	5635061	SWITCH
S1754	5635061	SWITCH
S1755	5635061	SWITCH
S1756	5635061	SWITCH
S1757	5635061	SWITCH
S1758	5635061	SWITCH

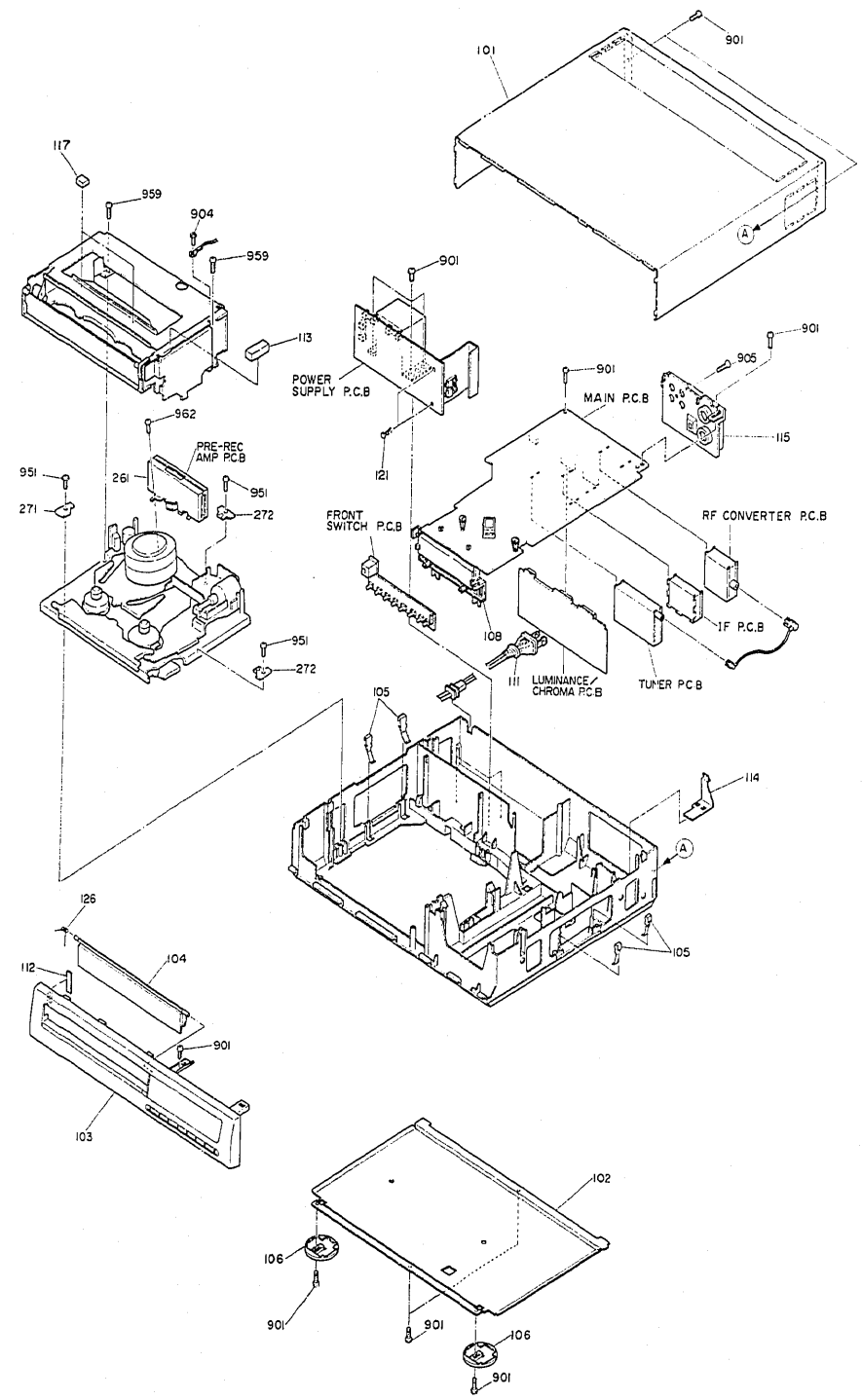
SYMBOL-No	P-No	DESCRIPTION
TU 501	5582161	TUNER UNIT
IF 501	5583822	IF UNIT
RF 501	5589241	RF CONVERTER
V 751	5315175	FLUORESCET INDICATOR TUBE
SCR 851	5390191	THERMISTOR (VT-M140AW)

MECHANICAL PARTS LIST

SYMBOL-No	P-No	DESCRIPTION
		FOR FINAL ASSEMBLY
101	6006923	COVER,TOP
102	6006935	COVER,BOTTOM
103	6487541	PANEL,FRONT (M140A ONLY)
103	6487542	PANEL,FRONT (M141A ONLY)
103	6487543	PANEL,FRONT (M131A ONLY)
103	6487544	PANEL,FRONT (M141AW ONLY)
104	6487406	DOOR,CASSETTE
105	6527683	SPRING
⚠ 106	6442472	INSULATOR
111	5850753	CORD,POWER
112	7708382	STOPPER
113	4330231	FILT
114	6528141	PLATE
115	6485194	PLATE,REAR
117	6562611	CUSHION,RUBBER
121	6802271	BRACKET
126	6552333	SPRING
202	6915922	SCREW
203	7469871	BASE
204	5434061	HEAD
205	6304906	SPRING
206	6522752	SPRING
207	7785673	NUT
208	6820341	ARM
209	6555501	SPRING
210	6416121	SPRING
211	7789123	POLYSLIDER WASHER
212	6416131	REEL TABLE,TAKE UP
213	7789122	POLYSLIDER WASHER
214	6384352	ARM,PRESSER ROLLER
215	6805041	SLIDER BLOCK
216	7412822	PLATE
217	7429651	GEAR,LOADING(L)
218	7429661	GEAR,LOADING(R)
219	6911551	GUIDE ROLLER BASE(IN)
220	6424261	ROLLER,GUIDE
221	6911572	GUIDE ROLLER BASE(OUT)
222	6897071	BASE
223	5445851	HEAD FULL ERASE
225	4508237	GUIDE,TAPE
226	6555431	SPRING
227	7413665	HOLDER-BAND
228	7412863	ARM
229	6555446	SPRING
230	6897265	BRACKET
231	6896752	ARM
232	6555061	SPRING
233	6820351	ARM
235	7468853	BLOCK,LOADING
236	7398631	BRACKET
237	7412881	ARM
238	6976551	ARM
239	7412893	ARM
241	6896903	BRAKE
242	6551151	SPRING
243	6804792	BRAKE
244	6896895	HOLDER,MOTOR
245	6896852	ARM
246	6897251	ARM
247	6555483	SPRING
248	6897271	ARM
249	6897066	GEAR,MODE
250	6434861	WORM WHEEL

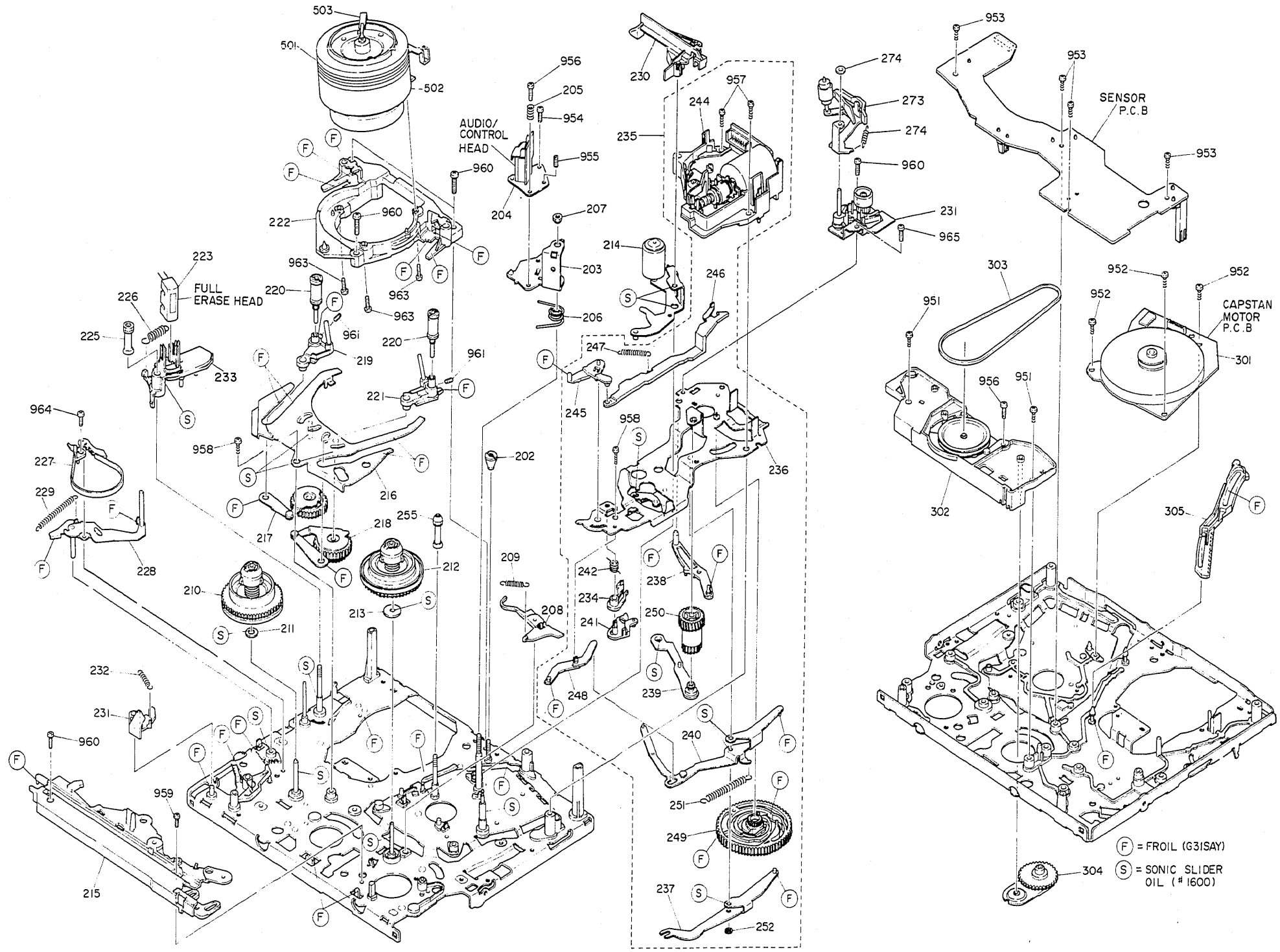
SYMBOL-No	P-No	DESCRIPTION
251	6555052	SPRING
252	7799012	WASHER
255	4508235	GUIDE
261	4131003	PWB ASSY PRE AMP/HEAD SW
271	7429631	BRACKET
272	7429641	BRACKET
273	7472125	ARM
274	7788348	WASHER
301	5571741	MOTOR,CAPSTAN
302	6804831	CULUTCH BASE ASSY
303	6351555	BELT
304	6897095	ARM,FF/REW
305	6434852	RACK
402	6804982	BRACKET
403	6804962	BRACKET
404	6896971	WORM WHEEL ASSY
405	6435571	WORM
406	4508221	WORM SHAFT
407	6804992	BRACKET
408	6896632	ARM-SWITCH
409	6302474	SPRING
410	6897041	ARM-SWITCH
411	7412583	BRACKET-GEAR
412	7449178	HOLDER
413	7449164	BASE,CASSETTE HOLDER
414	6896664	HOLDER,CASSETTE (R)
415	7428113	HOLDER,STAY
416	6820361	ARM
417	6897001	ARM
418	6556241	SPRING
419	6896673	HOLDER,CASSETTE (L)
420	7412944	ARM
421	6555772	SPRING
422	7412953	SPRING
423	6806531	HOLDER,FRONT
424	7580791	SHAFT ASSY
425	7428982	BRACKET
426	7794391	WASHER
501	5457962	UPPER CYLINDER (CY-Z2N)
502	5436317	CYLINDER,LOWER(CY-Z2NC-L)
503	5792635	BRUSH,CYLINDER
901	8699410	SCREW(3X10)
904	8691406	3X6 BT BIND SCREW
905	7781582	FALT SCREW-3MMDX10MM (BLACK)
951	8691410	SCREW
952	8691308	BT SCREW-2.6MMDX8MM
953	8699408	SCREW
954	7781872	SCREW-3MMDX8MM
955	7773086	SCREW
956	8741414	SCREW (3X14)
957	8691412	SCREW (3X12)
958	8691408	SCREW (3X8)
959	8711406	SCREW - 3X6 PAN HEAD SCREW
960	8741412	SCREW (B3X12)
961	7785941	SCREW
962	8711404	SCREW - 3X4 PAN HEAD SCREW
963	7775581	SCREW(M3X14)
964	8741408	SCREW (B3X8)
965	8691308	SCREW (2X8)
		FOR ACCESSARIES
	5614891	REMOTE HAND SET
	5857952	CONNECTOR

EXPLODED VIEWS
CABINET SECTION

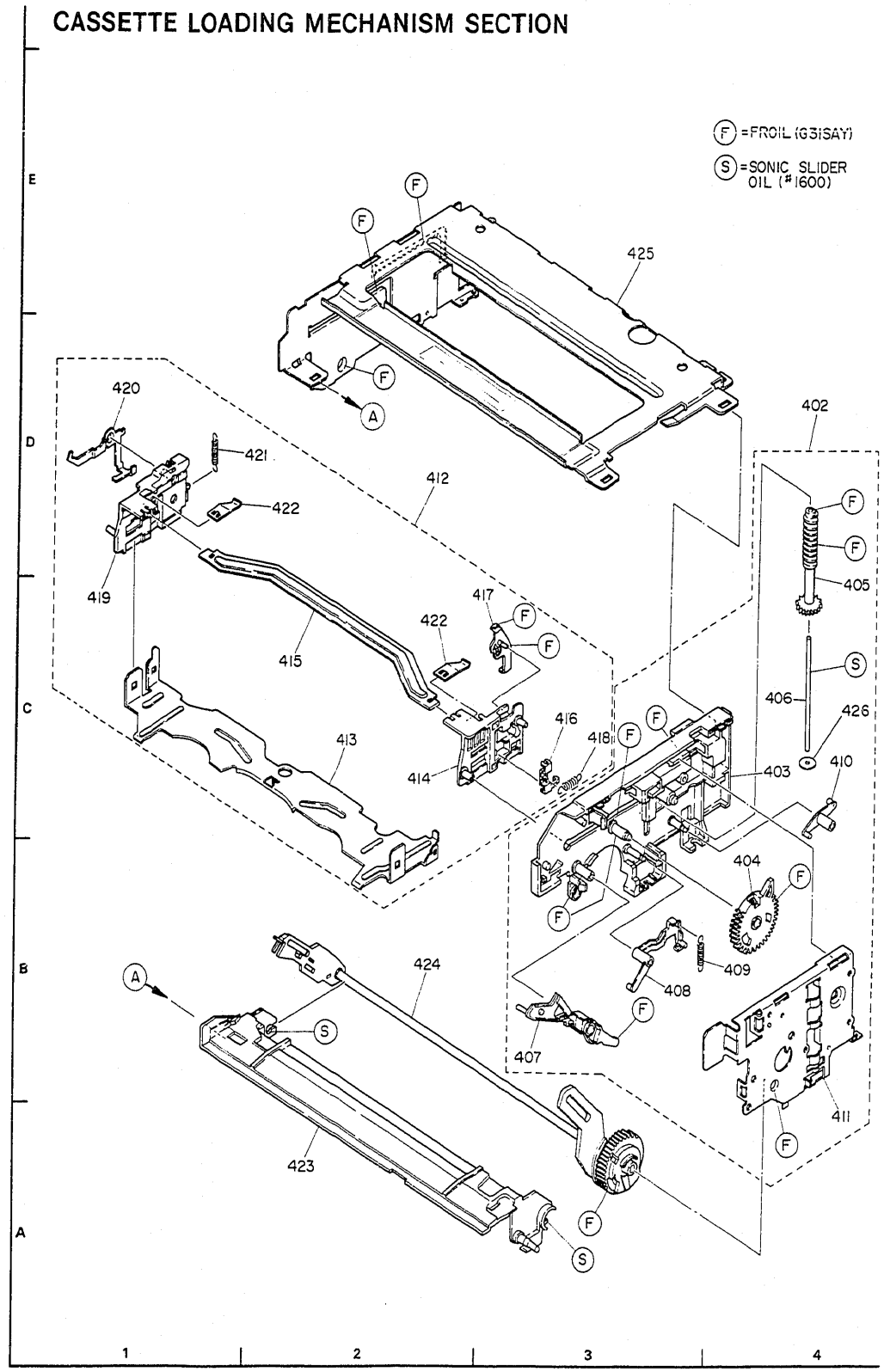


CHASSIS (I) SECTION

CHASSIS (II) SECTION



CASSETTE LOADING MECHANISM SECTION



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VT-M140A/M141A
VT-M140AW
VT-M131A

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